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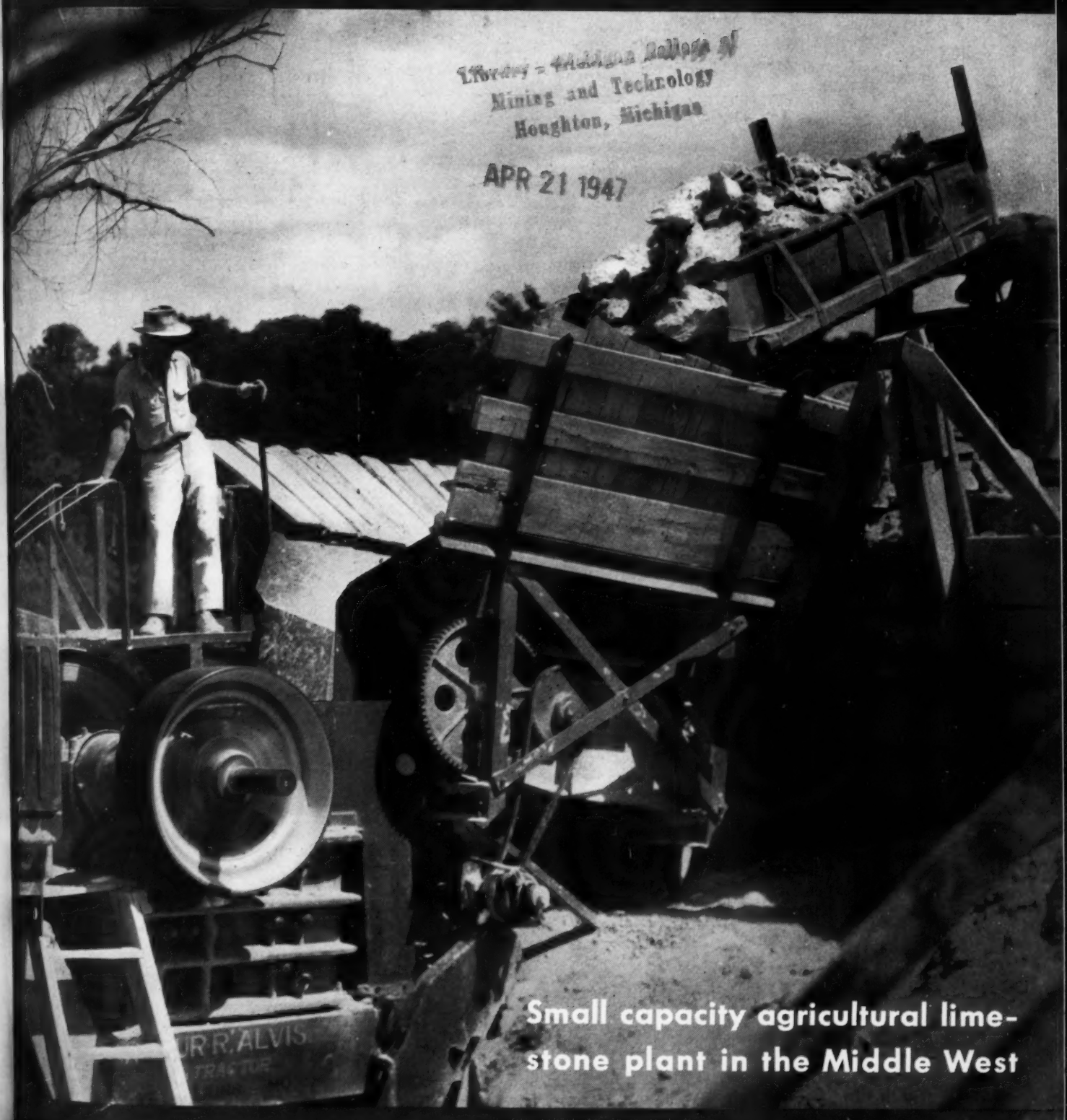

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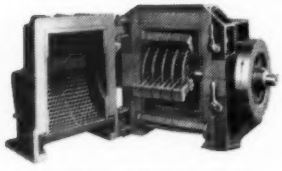

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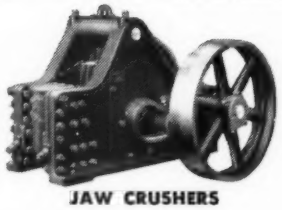

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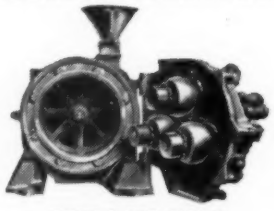

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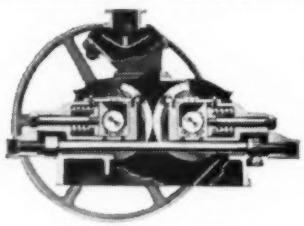

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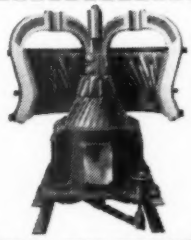

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"WE HEAR..."

April 1, 1947

A seasonal surplus of portland cement is piling up in the United States due to lack of shipping space for export to countries badly in need of cement. Cement reportedly is being bypassed in favor of better-paying commodities.

* * * * * * * * * * *

The employe cannot be fired with any assurance to the employer that he (the employer) is protected, as far as the NLRB is concerned, when the dismissal is requested by a union holding a closed-shop contract, principally because the employe testified against the union before the NLRB.

* * * * * * * * * * *

Home building costs have climbed 50 per cent in less than two years and the average for all building is 88 per cent over 1939 figures. Small wonder that authorities term price levels as critical! Orderly stabilization of prices, which by the way is predicted by the more optimistic observers, in 1947, is the only alternative to the building industry pricing itself out of business. That happened after World War I.

* * * * * * * * * * *

A returned veteran desiring reemployment must be reinstated to his job by his employer even when he left that job to join the services while he had occupationally-deferred status.

* * * * * * * * * * *

The Gulf Coast, into which DuPont, Dow, Shell, Monsanto and other large manufacturers of chemicals are pouring millions of dollars for new plant construction, likely will become one of the nation's largest chemical manufacturing centers. Cheap and readily available raw materials, among them oyster shells for lime, are an important factor in the development.

* * * * * * * * * * *

Anti-closed-shop sentiment is gaining in momentum, with eight States already banning the practice. Bills have been introduced in three additional States, making the closed-shop illegal.

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With a threatened shortage of carbon black, which gives toughness to automobile tires and tubes of synthetic rubber, "carbon white" may soon be able to compete commercially. This product, already developed experimentally, is a powdery fumed silica made from burning sand and alcohol.

* * * * * * * * * * *

Collective bargaining on an industry-wide or area-wide basis has encompassed more than 4,000,000 workers as of early 1947; that number of workers being employed in industries where union contracts are negotiated for the industry as a whole, or between groups of employers and unions. That principle of bargaining has made little progress, as a result of effort by unions, in the mass-production industries.

* * * * * * * * * * *

It is not a safe bet, according to a recent National Labor Relations Board ruling, to deny a union the right to solicit membership in a company plant if that privilege has been granted to another union.

* * * * * * * * * * *

In the search for economical means to utilize low-grade iron ores in steel manufacture, the Bureau of Mines reportedly has obtained promising results by several flotation methods in the separation of impurities from the ore. Hydrated lime is utilized in most of the methods employed by the Bureau.

* * * * * * * * * * *

Magnesium uses are gradually expanding into new fields, according to reports from Canada which indicate that dolomite may continue to have an outlet for its potential metal content. Magnesium produced by Dominion Magnesium Corp. is being used in fire-fighting equipment, for power saws, fishing rod handles and in the textile industry, with considerable export to Europe. Important changes to lower production costs are contributing to market development.

* * * * * * * * * * *

Total new construction in January, 1947, amounted to $847,000,000, according to a U. S. Department of Commerce report. This figure reflected a normal seasonal decline of approximately seven per cent from the preceding month but represents a 78 per cent increase over total dollar volume of construction a year ago.

* * * * * * * * * * *

Social Security payments are unlikely to be increased beyond the current rate of one per cent levied on employers and employes alike, since the present rate has been shown sufficient to meet expected payments for the next five years.

* * * * * * * * * * *

Lime's versatility has again been demonstrated in the field of fungicides. Dithane, a new product said to have great possibilities in halting the spread of late blight in tomatoes, is used as a spray in combination with hydrated lime and zinc sulphate.

* * * * * * * * * * *

On the right side of the ledger from the point of view of the employer, refusal of a union to bargain in good faith can under some conditions discharge the employer from responsibility for not bargaining. Where good relations had existed in the past between an employer and a union, the NLRB ruled in a recent decision that the employer's good faith need not be challenged.

* * * * * * * * * * *

It may be that some relief from high prices is coming soon to the individual. The Labor Department's cost-of-living index has showed a decline for the first time since December, 1946. Price rises had added 56 per cent to the cost of living since 1939, with an increase included of 21 per cent since June, 1946.

* * * * * * * * * * *

There are now more than 200 manufacturers of prefabricated homes, who may build over 100,000 housing units in 1947 to triple 1946 performance. In spite of local building code restrictions, opposition by certain builders and labor unions, and lack of qualified dealers, the "prefab" house likely will comprise 10 per cent of all homes built in 1947.

* * * * * * * * * * *

One of the byproducts to the extraction of oil from low-grade oil shale in Germany during the war, by a process now available to the American oil shale industry, was a shale usable as hydraulic lime or for the manufacture of portland cement when heat-treated and mixed with limestone and coke.

THE EDITORS

★ ★ ★ Editor's Page

Guaranteeing An Agricultural Limestone Market

OUR "POLL" of the probable effect on volume of liming materials that farmers would spread, should federal soil conservation payments be drastically reduced or eliminated (in this issue) indicates that the agricultural limestone industry is far from prepared to cast off its dependence on political decision. The industry, with exceptions of course, most certainly should have operated on the premise that federal aid could and probably would eventually be sharply reduced or even come to an end, by initiating and expanding educational effort to inform both farmers and consumers of the benefits and absolute necessity for soil liming.

While Congress ponders the scope of the 1948 conservation program, and apparently the fate of many producers who are alarmed because they have no hold on their customers, those same producers might start laying the groundwork to protect their markets against anticipated further attack by budget-slashing economists for the years 1949, 1950 and from then on. A great number of producers, far too many, have been order-takers, in fact, not merchandisers; and it is questionable whether they really understand the true benefits of soil application or know the merits of their own product.

Sales Tools

Calcium is fairly well recognized as an acid-neutralizer, or soil sweetener, but why let it go at that? What about the other valuable functions that pulverized calcium carbonate performs in the soil? Calcium, after all, is the number one mineral plant food; it promotes normal biological activity in the soil; liberates potash, phosphates and other plant foods from combinations otherwise unavailable to plants as food; and, through chemical action, improves soil workability.

Those attributes of agricultural limestone, and there are many more, should be sought out and can be converted into sales promotional material to assign scientific values to a product which the farmer and the public now under-estimate.

Anticipation of a buyer's market, already approaching in a few areas, will provide impetus to the program, as producers learn that they have in their own products certain differences from their competitors' that are marketable.

Every limestone deposit differs in some respects from others, chemically or physically, and there are variations in uniformity according to geologic formation—differences that are merchantable in competitive selling. Agricultural limestone from one quarry, while it may have the same neutralizing value as the product from another or when compared to the stone selectively excavated from another section of the same ledge, can have a different rate of solubility in rain water, soil water or other water containing carbon dioxide in solution.

Since calcium and magnesium carbonates become reactive in the soil only as they enter solution, the rate of solubility is of interest to the farmer who, generally speaking, is an impatient individual not content to wait unduly long for tangible results from expenditures to which he has at least contributed.

Differences in calcium carbonate equivalent—neutralizing value—and fineness of grind, uniformity of product at destination, and service rendered are factors that will enter into competitive merchandising as supply approaches demand in any given area.

Standardized Practice

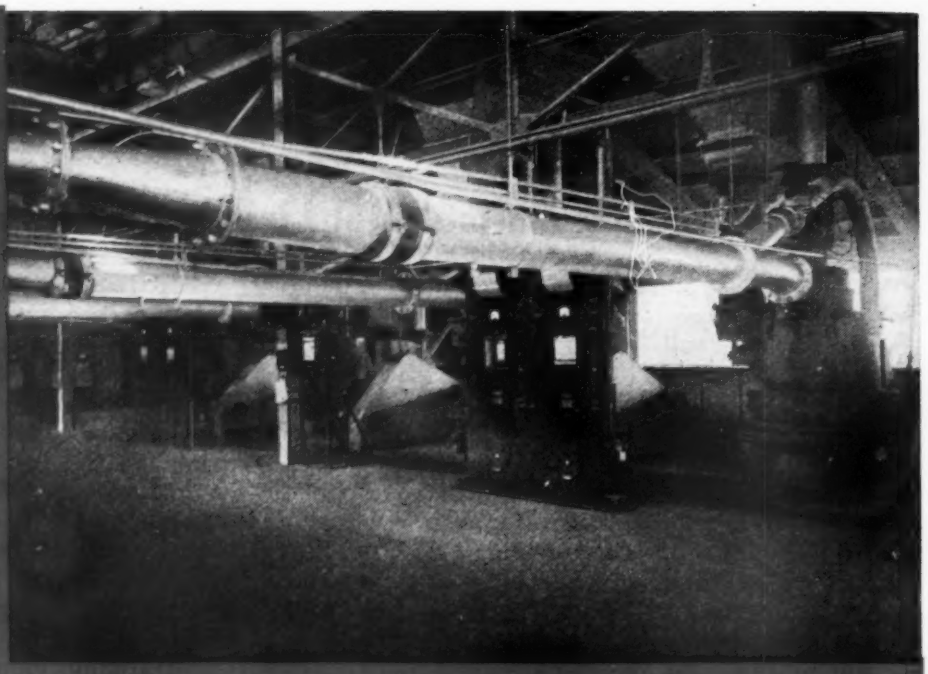
Then the agricultural limestone industry can anticipate needed standardization and a more scientific approach to the practical aspects of production and liming, in general, lack of which has hampered the industry and hindered the wider acceptance of agricultural limestone, through non-uniform stands of crops and too-long delayed results.

Standardized practices will come sooner or later, for it seems that an era of standardized agriculture has been well started. We see products on the shelves in our stores which are an indication that a trend has started toward selling food on the basis of its food value—its nutrients—rather than on unit weight or volume alone. Some of today's foods look good and probably do not taste so bad but they have little food value and, if our prediction is correct, would be priced accordingly in the markets of the future.

This, we offer, as another argument in favor of wider usage of liming materials over the nation. Spotty application, geographically, if sustained, could well place the agricultural products of any territory or State in an unfavorable competitive position if pricing schedules are based on food nutrients. Those in Washington who have the power to accept or reject soil conservation budgets will do well to consider all the facts before making a decision that might seriously hamper the national liming program or even jeopardize the agricultural standing of their home states.

Bror Nordberg

Four B & W Type E Pulverizers used for kiln firing in an eastern cement mill



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Rocky's NOTES

Nathan C. Rockwood

The Industry-Wide Wage Issue

SOME of our good friends among industry spokesmen seem to be on opposite sides in the debate before the Congressional labor committees on suggested restriction of union activities. One point at issue is: Should industry-wide union labor bargaining be prohibited? Although this issue may have been settled by Congress before this page gets into print, it is likely to be a live issue for a long time to come, as to whether Congress did or did not make the right solution.

To us the issue does not appear to be as important as some other issues connected with the settling of labor-management controversies, because the objective of a law prohibiting industry-wide bargaining could be accomplished by other means, and prohibitions are not constructive measures for settling any debatable issue. The objective apparently is to prevent a union gaining such a monopoly of labor supply in any industry as to bring about a national crisis, as the United Mine Workers did last fall in jeopardizing all industry by tying up coal producton. The argument on the other side appears to be that employers gain some degree of collective courage and security by all having to meet union demands at the same time under the same conditions.

Procedure Now Subrosa

The law does not specifically authorize unions to demand bargaining on an industry-wide basis, or even on a company-wide basis, where a single corporation has many plants in various localities. Their right to do so, however, has been tacitly recognized by the National Labor Relations Board. The employers, on the other hand, under the anti-trust laws, are prevented from getting together to agree on any joint action on wages, since wages are a part of costs and costs are what make up prices. When union tactics compel employers to act more or less in concert, there appears to be no tangible violation of the anti-trust laws, so that legal or otherwise, employers do have the necessity for collective action.

Our belief is that whether or not Congress restricts this kind of wage bargaining, it is not an intelligent procedure for it is not ultimately in the true interests of the workers themselves. It is a form of regimentation, which will tend to spread more and more until the union worker is completely at the mercy of his union bosses. For any one who has had an opportunity to work and live in both big cities and in the country, and in various parts of the United States, knows that living conditions and living costs are not, and probably never wll be, standardized, country-wide, or even state-wide, except possibly in some of our smallest eastern states. We can conceive of no logical reason why a man employed, say in Cedar Rapids, Iowa, should receive the same wages for the same kind of work as a man in metropolitan New York or Chicago.

Country Living Worth the Price

The Iowa man, in normal times, probably pays less than half as much rent for better quarters than his big city cousin; he is closer to sources of good wholesome food; probably he can obtain most of what he cannot produce himself from neighboring farms; he has no daily carfare; his amusements and entertainment costs are less, and in all probability his family medical and dental expenses are less because his surroundings and environment make for more healthful living. A wise workman therefore appreciates these things and is willing to accept them for less money wages, but infinitely more real wages, than his city competitor.

National Gypsum Co.'s Policy

We do not believe in industry-wide bargaining even as applied to a single employer, whose plants are widely separated geographically, and for the same reason given above. We believe the labor policy pursued by the National Gypsum Co. to be more logical and more likely to be successful in the long run. This policy we happen to know about because we have just been reading the 1946 annual report of the company's president, M. H. Baker, for whom we have great respect as a business executive in step with the times.

Mr. Baker reports: "There were many issues between management and labor, but they were settled under the company's policy that wages shall be no less than for similar jobs in the same community; that working conditions shall be as favorable as is practical to provide, and that the plant managers shall bargain with any group properly representing the workers.

"Through the loyalty of plant workers and the patience of company managers, the year closed with but one major strike. That occurred at the New York City plant, which was closed for over two months last spring before a satisfactory agreement was reached. The incident was particularly regrettable because it was the only serious strike in the company's history.

"Employee relations have always rated major consideration. The host of problems entailed can readily be appreciated by considering there are twenty-four plants spread over fifteen states and Canada—each with problems peculiar to its respective section. At each plant, an experienced manager is authorized to administer with a minimum of supervision from headquarters. Limited only as to general policy, employee relations are determined at each operation to conform with local practices."

Law Change is Secondary

It is apparent that in the case of this company, at least, labor disputes were settled without prohibition of industry-wide bargaining and possibly they could be settled in many other instances by equally forthright and honest approach. It appears that "vice-presidents in charge of employee relations" seldom solve labor disputes. Too often they are window dressing to convey the dictates of a board of directors as tactfully as possible. Probably few employees recognize such a vice-president as the real "boss." The real boss to them is the manager of the plant where they work, and the "big shot" from the home office is an object of curiosity rather than of respect; for, the natural reasoning is, "what does that city guy know about our problems?"

He may know a lot, and he may be well grounded in the science of psychology and human relations, but it is the man who hires and fires and lives among them and has the same community interests that workmen look to for understanding of what they generally think are problems peculiar to themselves. So, with a capable and understanding local manager, it would seem to us that it is not greatly important whether industry-wide bargaining is prohibited or not, provided the local manager has adequate authority to settle his own labor problems on a basis that an eminently fair general management approves.

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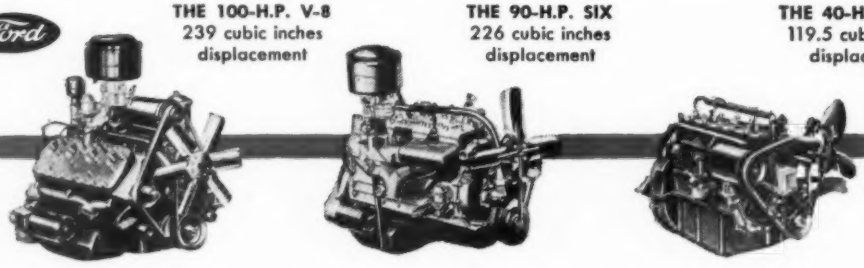

FORD-BUILT ENGINES

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Association NEWS

TROUBLES in Europe and Asia may seem to have only a remote connection with the rock products industry, but today they have a very serious import to one of the biggest problems faced by industrial mineral producers. The tremendous movement of grain and other relief supplies to Europe has completely thrown out of balance the normal exchange of box car equipment on the railroads. Cement, lime, and gypsum industries are particularly hard hit by the almost complete disappearance of box car equipment in certain areas, necessitating plant shutdowns with storage capacity being completely filled up.

So-called black markets have developed for finishing lime, not so much because of inadequate supply but of poor distribution. It is expected that the situation may become worse. Producers have resorted to truck haulage, but this mode of transportation is entirely inadequate for commodities which normally move by rail. The United States and Canada are finding the problem of supplying a poverty-stricken world a difficult, if not impossible task. We cannot continue the present load without constricting our own industries.

Standards for Approval of Non-Residential Construction

For those companies contemplating construction work, the latest release of CPA is Direction 3 to VHP-1. As pointed out by V. P. Ahearn, executive secretary, National Sand and Gravel Association, this order sets forth the standards for reviewing applications under VHP-1 for permission to do non-residential construction of the type restricted by the order. However, not all non-residential construction is controlled by VHP-1. Among the excluded types are the following: highways and streets, dams, reclamation, river and harbor works, communication facilities, water and sewer lines, and water supply and sewage treatment projects.

While the Office of Temporary Controls has raised the amount of permissible non-residential construction from $35,000,000 to $50,000,000 weekly, the tightest kind of controls on construction are still imposed. Permits to build will be issued only when it is shown that the proposed construction is essential and non-deferrable, or unless it is necessary to alleviate or forestall an extreme and unusual hardship, or unless it will not use scarce building materials needed for the housing program. Present legislation will wind up affairs of the Office of Temporary Controls on June 30, but provisions may be made to have VHP function under some other more permanent authority.

National Management-Labor Council

The committee for Economic Development has proposed the creation by law of a permanent national management-labor council to make continuing studies of industrial relations. Members of this council would be appointed by the President, subject to confirmation by the Senate, and would work with a greatly strengthened Federal Mediation Service. The council would be required to report annually to the President on the state of industrial peace throughout the nation, to confer regularly with the secretaries of Labor and Commerce and the chairmen of the Senate and House labor committees, to advise the director of mediation on matters of policy and to approve the appointment of all mediators. Two recommendations also have been made to make collective bargaining work better. One is that no strike be called or strike vote taken until bargaining has had a chance to function and the mediation service given an opportunity to settle the dispute. The other would require that differences arising from the interpretation of the terms of agreements be arbitrated.

Remove Building Restrictions

Speaking before the National Association of Home Builders in Chicago, Rep. Jesse P. Wolcott, chairman of the House Banking Committee, said that hearings on legislation to restore complete freedom of action to the construction industry will begin about the middle of March. He said that he will soon introduce legislation designed to repeal the Veterans' Emergency Housing Act of 1946 (known as the Patman Act), with the exception of two provisions; one of these would continue Title 6 guarantees by the Federal Housing Administration, the other would maintain some kind of veterans' preference in the sale and rental of housing. The new bill will not include any authority to restrict non-residential building or to allocate building materials to any specific purpose, and will remove governmental authority to set maximum prices on new residential building. He suggests rental controls be continued until March 31, 1948.

Change Lime Safety Competition Rules

It has been announced by the National Lime Association that the rules governing the 1947 Safety Competition have been changed. The 1947 rules have been changed with respect to Rule 1—Awards. Heretofore, all lime processing operations, whether they were comprised of calcining plants and quarries or calcining plants and underground mines or calcining plants alone, have competed against each other. It has been decided that, in order to achieve more equitable competition, groups should be established according to the processes comprising an operation. Upon analysis it was found that operations could be divided into three groups, with one group subdivided according to manhours. The three groups are: (a) 1. Lime operations with both quarry and calcining plant working 100,000 or more manhours during the year, and 2. Lime operations with quarry and calcining plant working less than 100,000 manhours during the year; (b) Lime operations with both underground mines and calcining plant, and (c) Lime calcining plant without associated quarry or mine.

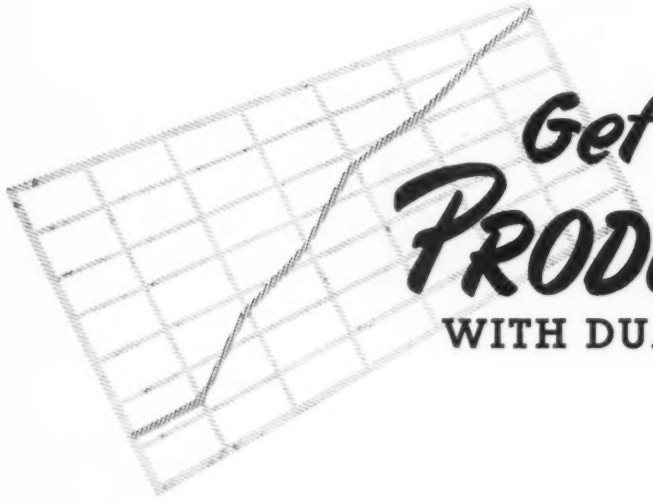
No Coal Strike?

Opinion throughout the country is almost unanimous in the belief that there will be no coal strike before July 1, when the coal operators are scheduled to take over their properties from federal control, and it is expected that the government will take steps to see that a contract is arranged between Lewis and the coal miners before June 30, the date when government control ceases.

Legislation also is under consideration to provide the government with the power of injunction against strikes in industries affecting national welfare; such as, communications, steel, coal, railroads, oil, and utilities.

Home Program Slowing Up

Housing Expediter Frank R. Creedon has been informed by his staff that the estimate of one million new homes to be started in 1947 is far too high. No more than 825,000 can be begun if federal controls and financial aids are continued in full force and only 750,000 if they are dropped, according to the report. Higher costs, materials scarcities and lack of manpower will slow up the program.



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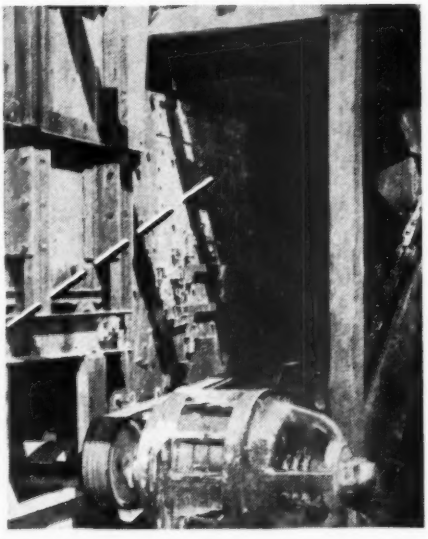

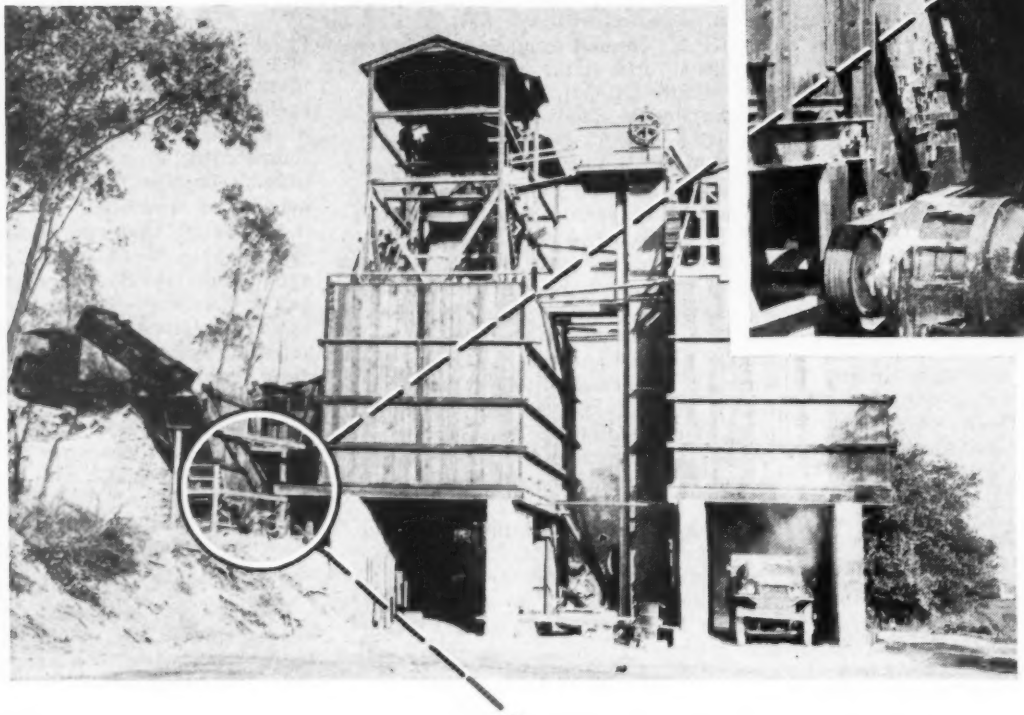

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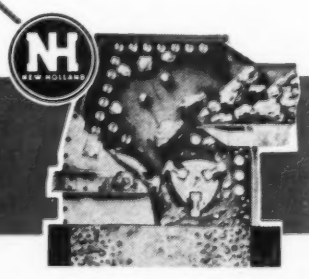
NEW HOLLAND
DOUBLE IMPELLER BREAKERS



PRIMARY AND SECONDARY CRUSHING IN ONE OPERATION

the *Personal Side* of the news

West Coast Promotions

FLOYD ERICKSON has been promoted to general sales manager of the Consolidated Rock Products Co., Los Angeles, Calif., in a recent expansion move of the sales organization. CHAUNCE LEVALLEY has been made assistant general sales manager; BILL KINGSBURY, assistant sales manager of the building materials division; BYRON WEINTZ, assistant sales manager of the ready mixed concrete division; JAY LILLYWHITE, district manager of Orange County; and TOM LANE, district manager of the Harbor division.

Named Superintendent

ARTHUR E. TULK, executive vice-president of the Cleveland Quarries Co., Cleveland, Ohio, has been elected president to succeed E. T. Ripley, who has resigned because of ill health after 40 years of service with the company. Mr. Ripley plans an extended vacation in Florida. WILLIAM M. JONES, formerly general sales manager, and H. C. AURAND, formerly director of industrial relations, have been elected vice-presidents, and C. A. WIRTZ has been reelected secretary-treasurer.

Heads New Association

ROBERT G. KERN of Columbus Builders Supply, Inc., Columbus, Ohio, has been elected to head the Columbus Concrete Block Manufacturers' Association recently formed to coordinate promotional activities of individual members. JOHN M. SWICKARD of Swickard & Crissman, was elected vice-president, and JOHN F. ROYER, secretary.

General Sales Manager

WILLIAM CASPARI, general sales manager of the superphosphate and export divisions of The Davison Chemical Corp., Baltimore, Md., has also been appointed to the position of general sales manager of the phosphate rock division, Bartow, Fla. Mr. Caspari will make his headquarters in Baltimore, Md.

Plant Superintendent

WALTER R. SWANK has been appointed superintendent of the new Asbestos Company of Texas, Houston, Texas. This announcement was made by Otis Massey, president and general manager of the company which is building a new $750,000 plant north of the Katy Road between the Post Oak Road and the Hempstead Highway, for the production of asbestos-cement shingles, roofing, clapboards, corrugated sheets and asbestos boards. During the war Mr. Swank served as a combat engineer on Saipan and Okinawa and was discharged as a major.

Export Sales Manager

FRANK POTTS has been appointed export sales manager of the Permanente Cement Co., Oakland, Calif., which recently revealed plans to increase production from 5,000,000 to 5,500,000 bbl. annually. Mr. Potts joined the company in 1943 and has had experience in the general export sales departments of several Kaiser companies. W. J. GLEASON has been named export sales manager of the Kaiser Company, Inc., Iron and Steel Division.

New A.C.I. Officers

STANTON WALKER, Washington, D. C., has been elected president of the American Concrete Institute, Detroit, Mich., to serve until the 1948 convention. He succeeds Harrison F. Gonnerman, director of research, Portland Cement Association, Chicago, Ill. Mr. Walker has been a member of the Institute since 1921; a member of the board of directors since 1940; and vice-president for two years. He is director of engineering of the National Sand and Gravel Association and of the National Ready Mixed Concrete Association. Other new officers are: HERBERT J. GILKEY, Head of Department of Theoretical and Applied Mechanics, Iowa State College, Ames, Iowa, vice-president; W. H. KLEIN, Easton, Penn.; CHARLES H. SCHOLER, Head of Department of Applied Mechanics, Kansas State College, Manhattan, Kans.; and A. J. BOASE, manager structural bureau, Portland Cement Association, Chicago, Ill., regional directors. Reelected officers are: Robert F. Blanks, Denver, Colo., vice-president; Harry F. Thomson, St. Louis, Mo., director-at-large; Paul W. Norton, Boston, Mass.; R. R. Zipprodt, New York, N. Y.; and H. P. Bigler, Birmingham, Ala., regional directors.

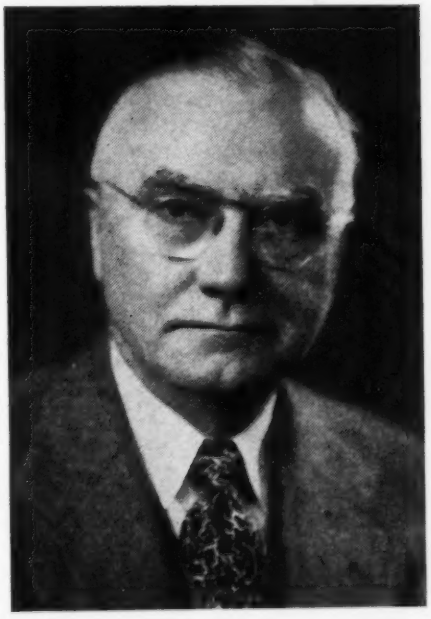


Photo by Harris & Ewing
Stanton Walker

In Charge of Sales

S. H. MACARTHUR has been elected vice-president in charge of sales of the Glens Falls Portland Cement Co., Glens Falls, N. Y. Other officers and directors are: L. R. Burch, chairman of the board; H. E. Harding, president and manager; J. E. Singleton, vice-president; R. C. Carter, secretary and treasurer; L. F. Goodson, assistant secretary and assistant treasurer; W. M. Bowden, L. R. Burch, R. C. Carter, H. E. Harding, S. H. MacArthur, M. W. McClay, T. C. Sherman, J. E. Singleton and D. A. Symmes, directors.

General Manager

HAROLD GEIST has been elected general manager of The Geist Coal and Supply Co., Cleveland, Ohio, large concrete masonry manufacturer and building supply dealer. Previous to his appointment, Mr. Geist was sales manager and advertising manager. HERBERT GEIST is president of the company.

Promoted

EARNEST A. MELKUS, quality supervisor at the Medicine Lodge, Kans., plant of the National Gypsum Co., Buffalo, N. Y., has been promoted to superintendent of the plant. He replaces Robert W. Warren, who has gone into business with his father-in-law who purchased a telephone exchange at Ellinwood, Kans. EDDIE GOOD, who has been employed at the Rotan, Texas, plant, will replace Mr. Melkus as quality supervisor at Medicine Lodge. ROBERT AXLINE of Medicine Lodge has been named assistant quality supervisor.

Engineering Consultant

RAYMOND B. LADOO has announced the discontinuance of his grinding and pigment business, operated as R. B. Ladoo Co., in order to devote his entire time to consulting engineering in the industrial mineral and chemical fields.

Association President

F. I. BRISTOL, owner and manager of the Bristol Silica Co., Rogue River, Ore., has been elected president of the Oregon Mining Association.

Iowa Agstone Elections

W. F. SHARPE, Dillon-Sharpe Co., Columbus Junction, Iowa, was re-elected president of the Iowa Agricultural Limestone Association at its second annual meeting recently held in Des Moines. HARRY D. BELLAMY, Concrete Materials & Construction Co., Cedar Rapids, Iowa, was re-elected vice-president, and CLINT A. ALLEN, Sargent Brothers, Inc., Des Moines, Iowa, again was chosen as executive secretary. Featured speakers at the meeting, which was attended by 75 producers of agricultural limestone, were S. P. Moore, chairman of the Agricultural Limestone Division, National Crushed Stone Association, and president of the Concrete Materials and Construction Co., Cedar Rapids, Iowa; Prof. B. J. Firkins, Iowa State College, Ames, Iowa; and Henry A. Huschke, managing director of the Agricultural Limestone Division of the National Crushed Stone Association, Washington, D. C.

Other directors are: G. B. Clarke, Gilmore City; E. F. Schildberg, Greenfield; Don Kaser, Adel; Vern Schield, Waverly; Lloyd McCabe, Knoxville; Leo Bruening, Decorah; and L. R. Falk, St. Ansgar.

Chemist Named Plant Manager

ALFRED W. SCHAEFFER, chemist at the Alsen, N. Y., plant of the Lehigh Portland Cement Co., Allentown, Penn., has been appointed manager of the plant at Metaline Falls, Wash. He will assume his new duties on April 15.

Vice-President of Sales

W. O. BOVARD has been appointed vice-president of sales for the Canada Cement Co., Ltd., Montreal, Canada. Mr. Bovard joined the company in 1911, and after serving as district sales manager in Winnipeg and Toronto, and as assistant general sales manager in Montreal, was appointed general sales manager in 1927.

Transferred to Chicago

R. A. LOVELAND, chemist at the Des Moines, Iowa, plant of the Marquette Cement Manufacturing Co., Chicago, Ill., has been transferred to the Chicago office under Dr. J. C. Witt, technical director.

Correction

H. D. BAYLOR has been named president of the Louisville Cement Corp. and not of the Louisville Cement Co., as given on page 77 of the February issue of ROCK PRODUCTS.

Purchasing Agent

WILLIAM E. SIPE has been named purchasing agent for the Southwestern Portland Cement Co., Osborn, Ohio, to succeed William Hupman who died February 5 after a long illness. Mr. Sipe has been associated with the company for a number of years as assistant purchasing agent.

Plant Manager

JOHN T. LYNN has been appointed plant manager of the Ormrod, Penn., plant of the Lehigh Portland Cement Co., Allentown, Penn., to succeed William J. Montz, who has retired after nearly 50 years of service with the company. Mr. Lynn has been assistant plant manager and supervising chemist since last August when the plant resumed operation. Prior to that, he was chemist. Mr. Montz has held the position of plant manager at Ormrod for many years. He was employed in 1898 as a machinist when the first Lehigh mill was under construction and progressed through the grades of foreman and general foreman to that of plant manager.

Named Director

LOUIS WARE, president of International Minerals and Chemical Corp., Chicago, Ill., has been elected a director of the United States Gypsum Company.

Resigns

J. METCALF WALLING has resigned as administrator of the Fair Labor Standards Act, the so-called Wage and Hour Law.

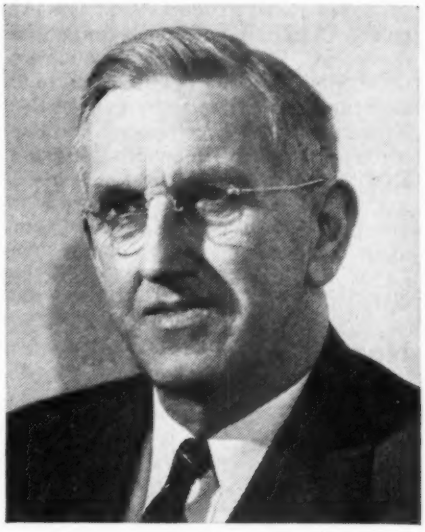
Moves Office

VICTOR J. AZBE, consulting engineer on lime, has announced the removal of the Azbe Corporation offices to 8135 Forsythe Blvd., St. Louis, Mo.

Col. Harry A. Montgomery, whose appointment as vice-president and chief engineer of the Material Service Corp. and subsidiaries, Chicago, Ill., was published in the February issue of ROCK PRODUCTS

Elected Vice-President

RALPH E. LARRY has been elected vice-president of the Pittsburgh Limestone Corp., New Castle, Penn., to succeed H. L. Gordon, who has retired after 28 years of service with the company. Mr. Larry has been assistant to the president in Pittsburgh, Penn., for several years, after serving successively as plant superintendent, supervisor of industrial relations. He is a member of the American Institute of Mining and Metallurgical Engineers and the American Society of Safety Engineers.



Ralph E. Larry

Mr. Gordon was assistant general manager of the New Castle operations from 1919 to 1940.

Guest Speaker

HERBERT W. DIECKMANN, chief chemist at the Northampton, Penn., plant of the Universal Atlas Cement Co., New York, N. Y., was guest speaker recently at the Northampton Exchange Club. In a talk on the cement industry he said, "the greatest strides in the application of aluminum been made in the U. S." Mr. Dieckmann said that the first cementing material used in the world was rough clay, and that the Egyptians improved on this by adding a gypsum base. The Romans were first to use concrete, a secret lost for approximately 1000 years following the conquest of Italy by the northern barbarians. The making of concrete was revived in England during the 18th century. Portland cement was patented in 1924 by an Englishman named Aspin, who named it after an island from which he obtained stone for his work as a mason. Cement production in the United States, Mr. Dieckmann said, was brought on mainly through the digging of various canals. Joseph Navarro and his son began the manufacture of Keystone cement in 1888, in Lehigh County, and changed the name to Atlas in 1891.

OBITUARIES

DOUGLAS C. JEFFREY, manager of the Clarence Center, N. Y., plant of the National Gypsum Co., Buffalo, N. Y., passed away recently at the age of 55. Mr. Jeffrey started his career in the gypsum industry when he joined the Noble Gypsum Co. at Akron, N. Y., in 1916, and continued as plant manager when National Gypsum Co. took over the operation in 1935. He was made manager of the Clarence Center plant in 1938, and continued in this capacity until the time of his death.

FRANK D. MAURER, vice-president of the Duquesne Slag Products Co., Pittsburgh, Penn., died February 9 from injuries received when the auto he was driving skidded and crashed into two poles. Another official of the company, Robert Dierker, a passenger in Mr. Maurer's car, was admitted to the hospital in a serious condition. He was reported suffering from a possible skull fracture. Mr. Maurer was 44 years old.

MICHAEL A. EIBEN, president and founder of the Northern Blower Co., Cleveland, Ohio, died unexpectedly March 7 while in Fresno, Calif. He was 56 years old. A pioneer in the Industrial Safety Council, Mr. Eiben was a director of the Manufacturers' Division of the National Crushed Stone Association and a member of the American Mining Congress.

ARTHUR C. COBB, vice-president and general manager of the Georgia Lime Rock Co., Ocala, Fla., passed away February 22 at his home in Perry, Ga.

HERBERT H. HERRINGTON, who for 25 years operated a sand and gravel business in Oneida Castle, N. Y., died February 20 at the age of 67.

ERIC C. GYLLENSVARD, export and New York office manager of Farrel-Birmingham Co., Inc., Ansonia, Conn., was killed on February 17, when struck by lightning while in Sao Paulo, while on a business trip to South America.

WILLIAM HUPMAN, Osborn, Ohio, purchasing agent for the Southwestern Portland Cement Co., Los Angeles, Calif., died at his home February 5, following a long illness. He was 50 years of age.

EDWARD BAUER, a director of the Lawrence Portland Cement Co., New York, N. Y., died February 28 at his home in Elizabeth, N. J. He was 72 years old.

JEAN M. SIMONS, assistant manager of the Spokane Concrete Pipe Co., Spokane, Wash., passed away recently at the age of 34.

Trailer-mounted carrier for hauling bulk, dry cement

Ohio Quarries Safe

THE OHIO STATE INDUSTRIAL COMMISSION in its report of 1945 accidents showed that quarries and the erection and assembly of machinery had the fewest industrial accidents in the State. The metal goods industry had the largest number of accidents, commercial enterprises were second, followed by agriculture, mining, laundries, etc.

Sintering Plant Offered

A SINTERING PLANT at Baton Rouge, La., which cost the federal government $7,200,000 is being offered for sale or lease as surplus property. The equipment is said to be adaptable for cement production.

Open Gravel Pit

ARLING GRAVEL PIT, south of Ft. Loramie, Ohio, recently opened with Clarence Poeppelman in charge.

Truck Cement Carrier For Bulk Haulage

HERCULES STEEL PRODUCTS CORPORATION, Galion, Ohio, has introduced a bulk cement carrier Model 100-B which transports a load of from 100 to 110 bbl. of dry cement and is powered to discharge the full load in four minutes. It is designed to haul bulk cement from mill to warehouse and from warehouse to the job or individual contractor.

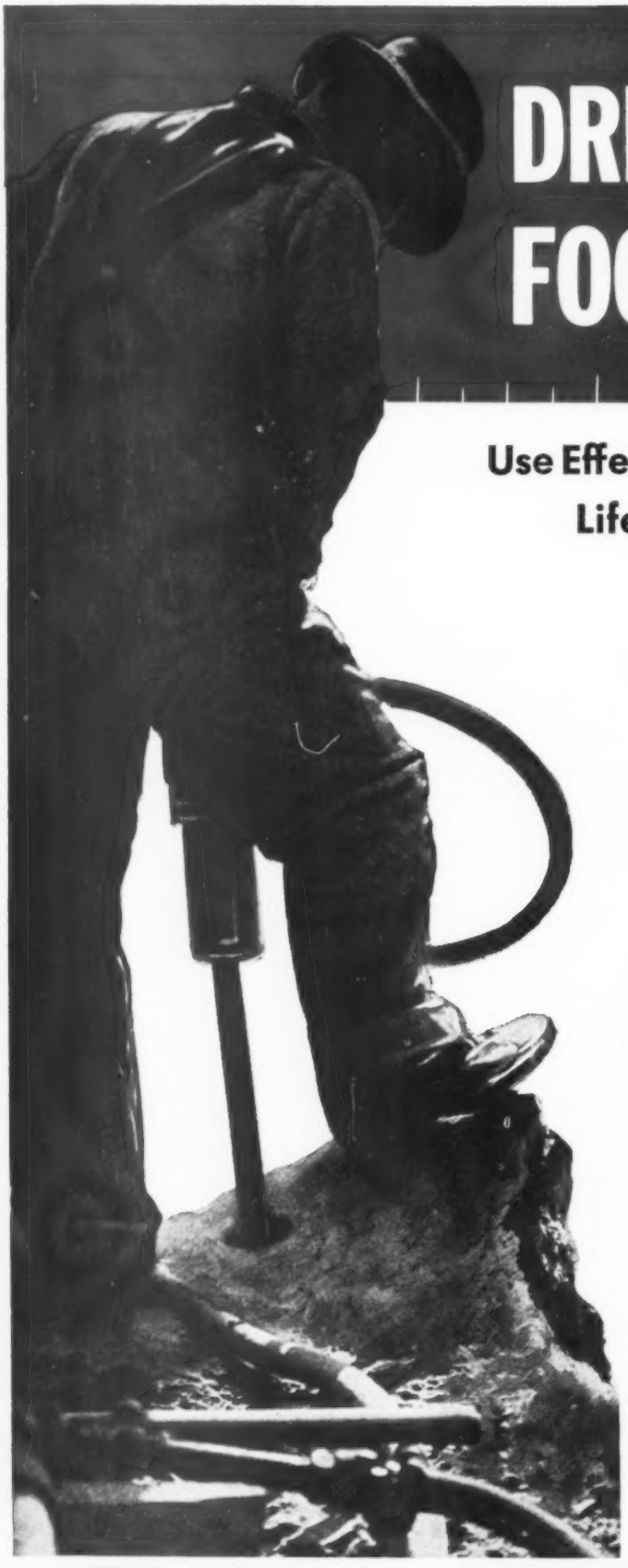
The cement carrier has three manhole filler openings, each opening having a hinged cover with manual locking device fitted with a tubular rubber gasket. Operation of this door is by means of a threaded shaft turned by a large handwheel, controlling the rate of discharge. The discharge chute is fully enclosed. A Wisconsin air-cooled, 4-cyl. gasoline engine supplies power for operation of the discharge mechanism.

Hard Metal Percussion Bits

CARBOLOY COMPANY, INC., Detroit, Mich., has developed, in cooperation with Ingersoll-Rand Company, a technique of permanently mounting ultra-hard Carboloy cemented tungsten carbide inserts in 4-point jackbits. For this use, the Ingersoll-Rand Company has developed a harder and longer wearing alloy steel drill rod with a special high-toughness stud connector to mount the bits on the drill rod.

The manufacturers point out that even the hardest of rock formations may be drilled with ease and speed. These Carboloy-set jackbits are said to be completely interchangeable with the new line of standard steel stud type Ingersoll-Rand 4-point jackbits, and may be used with drifters or stopers as well as jackhammers. It is claimed that in granite, for example, in which steel bits will drill 2 to 3 ft. before requiring sharpening, the Carboloy-set jackbits will drill up to 250 ft. before dulling. One curious factor in connection with the carbide bits is that there appears to be no appreciable reduction in cutting effectiveness or speed even when the cutting edges have become quite flat.

Left: Steel bit after drilling 2 ft. in granite. Center: Carboloy bits after drilling 249½ ft. in same rock. Right: New bit before drilling



DRILL GREATER FOOTAGE at Lower Cost

Use Effective Lubrication to Increase Drill Life and Reduce Maintenance Cost

You can't buy more effective lubrication than Texaco Rock Drill Lubricants (E.P.) — and those letters "E.P." are an important reason why. They mean the oil has Extreme Pressure properties . . . extra high film strength to protect drills under the toughest conditions.

In addition, Texaco Rock Drill Lubricants (E.P.) flow readily at all temperatures, resist oxidation, cling protectively to moving parts and reduce wear. They prevent rust and corrosion whether drills are running or idle.

This all-around protection keeps drills running smoothly and on the job longer, with less downtime for repairs and overhauls. That's why operators and drill doctors everywhere prefer Texaco Rock Drill Lubricants (E.P.) and why leading rock drill manufacturers approve them.

Call on Texaco Lubrication Engineering Service for helpful suggestions on drill operation and maintenance. Contact the nearest of the more than 2300 Texaco distributing plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

KEEP COMPRESSOR VALVES CLEAN

Here, too, effective lubrication is vital. *Texaco Alcaid, Algol and Ursa Oils* provide effective lubrication, prevent hard carbon formations, keep valves clean and active, rings free, ports open and air lines clear. Your Texaco Lubrication Engineer will recommend the right one to keep your compressors running right — efficiently and economically.

TEXACO

TEXACO Lubricants and Fuels

Tune in . . . TEXACO STAR THEATRE presents the NEW TONY MARTIN SHOW every Sunday night. See newspaper for time and station.

INDUSTRY News

Carolinas Plant Starts Operation

CAROLINAS CEMENT & LIME CO., Harleyville, S. C., is now in full production at its crushed stone and agricultural limestone plant. As mentioned previously in ROCK PRODUCTS, this is the first unit which will eventually include a cement and lime manufacturing plant. The agricultural limestone operation comprises a belt conveyor system to carry the broken stone from the quarry to an 8- x 90-ft. rotary dryer at the plant. The dried rock is elevated to the crushing, grinding, and screening section of the plant where it is reduced to the various desired sizes. Shipments have been at the rate of 10 carloads each day by rail on an 8-hr. operating schedule. J. Ross Hanahan, Charleston, S. C., is president; Charles F. Lewis, vice-president and manager; Thomas H. Carter, secretary-treasurer; Girard W. Moore, engineer and plant superintendent. Mr. Hanahan and Mr. Lewis are president and manager, respectively, of the Volunteer Portland Cement Co., Knoxville, Tenn.

Equipment includes: Robins conveyors, Vulcan Iron Works dryer with Traylor speed reducers; Pennsylvania hammermills, Northern Blower cyclone and Pangborn dust collectors, Tyler hum-mer screens, General Electric transformer and substation equipment, Riley-Jones stoker, Harbison-Walker refractories, Allis-Chalmers HD-7 bulldozer-tractor.

Supreme Court to Hear FTC Cement Suit

THE UNITED STATES SUPREME COURT has agreed to hear the suit of the Federal Trade Commission against the Cement Institute and 75 cement companies. This action follows a decision adverse to the Federal Trade Commission from the United States Circuit Court of Appeals at Chicago last Fall. The Justice Department asked the Supreme Court for a writ of certiorari, which the court granted.

Open Gravel Plant

MT. WHITNEY ROCK PRODUCTS CO., Lone Pine, Calif., has been organized by Geoff Watterson. A sand and gravel pit has been opened and screening and loading facilities are to be installed.

Permanente's Improvements

PERMANENTE CEMENT CO., Oakland, Calif., has announced improvements to increase capacity ten per cent to 5,500,000 bbl. annually. Equipment additions include: four Fuller coolers, an additional kiln feed slurry tank, new clinker conveying and crushing facilities, additional cement pumping equipment under the storage silos, and enlargement of the packhouse.

Buy Stone Concern

THE MUNCIE STONE AND LIME CO., Muncie, Ind., has been purchased by the M. D. and R. Stone Co., of Albany, Ind. Officers of the purchasing company include: A. F. Dunkin, Albany, president; Bert J. Runyan, Ridgeville, vice-president; J. J. Murnane, Dunkirk, treasurer. These men will hold the same offices with the newly acquired company, and both quarries and plants will be continued in operation. J. J. Murnane will head the Muncie operations, and D. J. Murnane will serve as purchasing agent and in charge of accounting for both plants. Bert Runyan will superintend operations at Albany. Mr. Dunkin will be in charge of sales and equipment for both plants.

Cement Exports Held Up

CEMENT MANUFACTURERS have lodged complaints with the Department of Commerce that shipping space has not been made available by ocean transport companies because they are unwilling to take cheap cargo during the present shortage of bottoms when better paying commodities than cement are available. This has resulted in a seasonal surplus of cement in certain eastern areas.

New Ready Mix Plant

CONCRETE MATERIALS, INC., Kansas City, Kans., recently opened a modern ready mixed concrete plant at 11 S. Fifth street. Officers are as follows: Guy E. Stanley, Jr., president; Glen E. Gates, vice-president; Orrin W. Shepherd, secretary; and R. J. Breidenthal, treasurer.

New Quarry

WHITNEY C. MILLER of Morris, Ill., has announced that a new company is being organized to operate a quarry and crushing plant in eastern Grundy County on a 36-acre tract with a deposit of about 7,000,000 tons of high-calcium limestone having an overburden of only one foot.

May Sell Cement Plant

PACIFIC COAST CEMENT CO., Seattle, Wash., may sell its "Diamond" plant on Marginal Way, Seattle, and its quarry at Dall Island, Alaska. General Construction Co., Seattle, Wash., is negotiating for the property for a reported consideration of $1,100,000.

Start Tex-Mex Cement Plant

TEX-MEX CEMENT CO., Corpus Christi, Texas, a new company organized by the Halliburton oil-well cementing interests, has started construction of the new cement plant at this location, according to Cedric Wilson, operating vice-president. Offices have been opened in the Smith Building in Corpus Christi. Dean Wilson, chief chemist, also will have his office here until the plant is completed.

Lehigh's Program

LEHIGH PORTLAND CEMENT CO., Allentown, Penn., pointed out in its recently issued annual report that $4,000,000 had been allocated for construction, rehabilitation, and plant improvement during 1946. As a result of materials and equipment shortages due to the coal and steel strikes, there remained $1,700,000 of $3,700,000 under contract. Some of the most important improvements included conversion at Sandt's Eddy, Oglesby, and Iola from rail to truck haul in the quarries; alterations to the pack houses at Union Bridge and Cleveland; the installation of a Cottrell precipitator at Buffalo; the changes required at Mitchell to operate on purchased power; and new quarry shovels at Iola, Mason City, and Mitchell.

In addition to the unexpended balance on construction orders of $1,700,000 carried over from last year, the 1947 program contemplates $2,800,000 for plant modernization. The sums range from $175,000 at Iola for such items as additional dust collectors, new storage crane, and machine shop equipment, to $750,000 at Sandt's Eddy for unit pulverizers, an extension to the stone storage building, the construction of a new change house, and an electric precipitator to collect dust from waste heat gases. The company contemplates the expenditure of $12,000,000 during the next three years for plant modernization and to improve working conditions. During the War years, the company segregated $4,000,000 in government securities for deferred construction, rehabilitation, and plant improvements. Because this fund was set aside for specific projects which have not yet been started, it was deemed inadvisable to use any part of it in 1946, according to the annual report.

Resume Agstone Production

SULLIVAN LIME CO., Rogue River, Ore., has been sold to T. T. Leonard, Springfield, Ore. Plans are going forward to resume production.

Pennsylvania Agstone Meeting

AGRICULTURAL LIMESTONE DIVISION, Pennsylvania Stone Producers Association, held its annual meeting March 24 in the Penn-Harris Hotel, Harrisburg, Penn. The program included a report by the Research Department, School of Agriculture, Pennsylvania State College, by the following men: J. W. White on Lime Lessons to be Learned from the Jordan Fertility Plots; A. C. Richer, Fertility Experiments on Corn and Small Grains; M. T. Henderson, Grasses, Legumes and Pastures; L. L. Huber, Corn Breeding; J. B. Washke, Small Grains Breeding; H. W. Higbee, Soil Surveys; and Dr. F. F. Lininger, director, Nutritive Values of Foods and Feeds Grown on Soils Rich in Health Protective Elements. Other speakers on the program were Hon. Miles Horst, Pennsylvania's Secretary of Agriculture; Clyde A. Zehner, State Director of Production and Marketing Administration, U. S. Department of Agriculture.

Big Year for Gypsum

BUREAU OF MINES reports 1946 as the peak year in the handling of crude gypsum in the United States, even surpassing the 1925 previous record. Mine output of crude gypsum in 1946 was 5,614,568 short tons. Although 5,679,300 tons were mined in the United States in 1925, imports of Canadian gypsum in 1946 set a record of 1,457,140 tons, making an apparent supply of 7,071,708 tons, a figure unsurpassed in gypsum history. Under OPA ceilings wallboard proved a better profit item than lath, and manufacturers concentrated on board rather than gypsum lath in 1946. When price ceilings were removed on November 9, however, producers announced their intention to make more lath. The normal lath-board ratio is about 2 to 1, but for several years the proportion has been reversed. Increased lath output will mean greater plaster demand and may ease wallboard requirements. Substantial increases also have been shown in base-coat plasters, lath, and wallboard. Plaster output has been curtailed somewhat by the shortage of retarder. Production figures for 1946 compared with 1945 are shown in table, below.

GYPSUM AND GYPSUM PRODUCTS IN THE UNITED STATES—1946

	January-December 1946 (Quantity) Tons	1945 (Quantity) Tons	Per cent change from 1945
Crude gypsum:[1]			
Mined	5,614,568	3,801,711	+48
Imported[2]	1,457,140	505,717	+188
Apparent supply	7,071,708	4,307,428	+64
Calcined gypsum produced[3]	4,198,229	2,474,007	+70
Gypsum products sold or used:[3]			
Uncalcined uses:			
Portland-cement retarder	1,133,736 [4]	659,544	+72
Agricultural gypsum	464,872 [4]	461,862	+1
Fillers and unclassified	29,921	19,204	+56
Industrial uses:			
Plate-glass and terra-cotta	35,765	20,197	+77
Pottery plasters	45,807	30,599	+50
Dental and orthopedic	13,261	13,994	—5
Other industrial uses	111,480	92,758 [4]	+20
Building uses:			
Plasters:			
Base-coat	1,501,243	640,933	+134
Sanded	111,170	67,531	+65
To mixing plants	16,426	10,878	+51
Gauging and molding	161,629	88,559	+83
Prepared finishes	12,174	6,994	+74
Insulating and roof-deck; Other building plasters	95,325	35,299; 15,551	+87
Keene's cement	32,867	14,029	+134
Lath	1,148,778 M. sq. ft.	599,210 M. sq. ft.	+92
Wallboard	1,899,527	1,284,210	+48
Sheathing	76,940	97,345	—21
Laminated board[5]	21,920	119,177	—82
Tile	18,865	18,637	+1

[1] Excludes byproduct gypsum, [2] Compiled from records of Department of Commerce, [3] Includes byproduct gypsum, [4] Revised figure, [5] Area of component board.

Approve Diamond Expansion

DIAMOND PORTLAND CEMENT CO., Middlebranch, Ohio, has received approval from the Office of Temporary Controls for its $750,000 expansion program which includes the installation of a new rotary kiln. According to Richard D. Raff, president, approximately $350,000 is to be spent for new equipment. It will be financed by the sale of 24,000 shares of common stock at $12.50 a share and a loan of $450,000.

Box Car Shortage

REPORTS from the Ohio finishing lime area indicate that some relief has been obtained from the recent acute shortage of railway box cars, but the problem is far from solved. S. G. Price, Gibsonburg Lime Products Co., Gibsonburg, Ohio, recently testified before the Senate Commerce sub-committee on the lime situation. Sterling Farmer, Sand Products Corporation, Cleveland, Ohio, and J. S. Coxey, Jr., president of the Industrial Silica Corporation, Youngstown, Ohio, testified for the industrial sand industry. Mr. Coxey said that unless orders are rescinded which now give priority to box cars moving west to aid in handling grain, there will be "industrial chaos in the East."

The present situation has created a boom in business for truckers who are hauling lime. Due to the shortage of lime, truckers who buy lime at the plant for about $13.50 a ton can sell it for as much as $80 a ton at some markets, according to local reports.

Shortages in open top equipment also are being reported. Shipments of 6000 carloads of sand and gravel for the Louisiana Department of Highways have been held up, slowing up the highway improvement program.

Earth-moving Equipment Show

INTERNATIONAL HARVESTER CO., Chicago, Ill., sponsored a complete exhibit of all types of power and equipment for earth-moving and construction at its Melrose Park plant on February 12. The show was unusual in that 32 other manufacturers had machines on display in addition to International's complete line of crawler tractors, industrial wheel tractors, and Diesel and gasoline engines. However, all of this equipment consisted of machines mounted on International crawler or wheel type tractors or self-powered equipment built by manufacturers using International power.

The Industrial Power Division of International Harvester Co. was created in 1944 as a separate and distinct division of the company. Its executive staff, with H. T. Reishus as general manager, occupies the administration building at Melrose Park Works. In addition to the newest Melrose Park Works, the others in this division are the Milwaukee Works and the Tractor Works in Chicago.

Kansas Cement Tax

A PROPOSED BILL has been introduced in the Kansas Legislature which would impose a 2 per cent production levy on cement, asphalt, coal, salt, lead, zinc, iron and copper.

Pavement Yardage

AWARDS of concrete pavement for February and the first two months of 1947 have been announced by the Portland Cement Association as follows:

	Square Yards Awarded Feb. 1947	First Two Mos., 1947
Roads	1,080,713	1,686,213
Streets and alleys	382,067	1,093,295
Airports	500	26,600
Total	1,463,280	2,806,108

Supreme Court Approves Foremen's Union

THE UNITED STATES SUPREME COURT by a 5 to 4 decision has ruled that plant foremen are "employes" within the meaning of the National Labor Relations Act, and are entitled to collective bargaining rights under the law. It is expected that Congress will enact legislation specifically exempting foremen and other supervisory employes from provisions of the Act. This decision upheld an order of the National Labor Relations Board to the Packard Motor Car Co., to recognize the Foremen's Association of America, an unaffiliated organization.

Blasting Tests

FRANCE STONE Co., Toledo, Ohio, plans to have blasting tests made at its Bellevue, Ohio, quarry under the supervision of Dr. L. Don Leet, Harvard University, well-known to the crushed stone industry as an expert on this subject. The stone company has been unable to operate since last Fall because a city ordinance prohibits blasting within this area. City officials will be spectators when the blasts are discharged and the results will be checked in the neighborhood where citizens charged that cisterns were cracked.

Expanding Operations

INDEPENDENT SAND & GRAVEL Co., near Newton, Ohio, has filed incorporation papers and plans to expand its operations in sand and gravel and ready mixed concrete. Incorporators are John Fogle, Gordon F. Defosset, and Kathryn M. Lohstroth.

Agstone Contract

ALLAMAKEE COUNTY, Waukon, Iowa, has awarded agricultural limestone contracts to Andrew Bresnahan, Waukon; R. J. Cooney, Waukon, Iowa; and the Roverud Construction Co., Spring Grove, Minn. The price delivered ranges from $1.90 to $2.25 a ton.

Start Ready-Mix Plant

ATHENS CONCRETE INC., Athens, Ohio, expects to be in operation early in April. The new plant, incorporated at $25,000, is headed by Dr. Edward K. Smith, Covington, Ky., president, and Mrs. A. T. Dowler, Athens, Ohio, secretary-treasurer.

Open Sand Pit

HALL BROTHERS, contractors, have opened a sand pit west of Marysville, Kans. Weather conditions have held up stripping operations, but it is expected that operations are now underway.

Start Agstone Plant

SOUTHERN LIMESTONE, INC., Sandersville, Ga., has started operations at its quarry and plant which is designed ultimately to have a capacity of 20 carloads daily, principally agricultural limestone. Henry Brandon is president.

Start Agstone Plant

THE CHOCTAW LIME Co., Hugo, Okla., is building a crushing plant at Ft. Towson, 14 miles away. About 75 per cent of the production will be agricultural limestone, according to J. W. Trieschmann, Sr., who is in partnership with J. Werner Trieschmann, Jr. The company is installing a Gruendler 4XC pulverizer with a daily capacity of 300 to 400 tons per day. Operation is to commence about April 15. Both partners are from Little Rock, Ark. J. W. Trieschmann, Sr., has been in the general building material business for 25 years in Arkansas and Louisiana, and has operated a lime plant at St. Joe, Ark., a crushing plant at Eureka Springs, and a sand plant at Caruthersville, Mo. J. W. Trieschmann, Jr., will be in active charge of production at the new plant.

Ladd Lime Resumes

LADD LIME AND STONE Co., Cartersville, Ga., has resumed full production after an extended shut-down. Sam James, president and his associates purchased the property from Raymond Hoagland and associates last summer. New machinery is to be installed to increase production and add other products.

Dredge Permits

THE KELLEY ISLAND LIME AND TRANSPORTATION Co., Cleveland, Ohio, recently applied to the War Department, Corps of Engineers, at Detroit, Mich., for permission to dredge sand and gravel from Lake Erie in an area southwest of West Sister Island.

The Schwartz Sand & Gravel Co., Cleveland, Ohio, has applied to the U. S. District Engineer's office at Buffalo, N. Y., for permission to dredge sand and gravel off a number of Lake Erie ports, including Lorain.

COMING CONVENTIONS

American Society for Testing Materials, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J., June 16-20, 1947.

National Industrial Sand Association, Annual Meeting, The Homestead, Hot Springs, Va., May 14-16, 1947.

National Lime Association, The Homestead, Hot Springs, Va., May 5-8, 1947.

Front Cover Picture

ON THE FRONT COVER of the April issue of ROCK PRODUCTS is shown the plant operated by Arthur R. Alvis, Butler, Mo. A Caterpillar Diesel operates the plant which has a capacity of 300 tons of agricultural limestone and 500 tons of crushed rock per day.

New Gypsum Plant

UNITED STATES GYPSUM Co., Chicago, Ill., has been issued a building permit from Berkley, Va., for the construction of buildings for its new plant. In addition to the main board plant, which will be 1400 ft. long, the permit covers buildings for paper storage, rock storage, kettle mill, crushing and screening house, locker building, shop, plaster warehouse and an office building. Total investment is estimated at about $2,000,000, and the project will cover 60 acres.

Sell Gravel Plant

FRANKLIN SAND AND GRAVEL Co., is the new name of a sand and gravel business near Carlisle, Ohio. It was formerly known as the Paff Sand and Gravel Co. plant before it was sold by Mr. Paff to Paul Carey, Englewood, Ohio. Mr. Paff has retained his trucks and announces that he will continue in the sand and gravel business.

Up Cement Prices

LEHIGH PORTLAND CEMENT Co., Allentown, Penn., has followed the action of other cement companies in the East in increasing cement prices. The boost covers both bulk and bag cement, the increases running from 12¢ to 20¢. The increase in prices for bag cement is attributed to the two increases in bags of 15 per cent last Fall and 17 per cent in February this year.

Install Dust Equipment

CEMENT COMPANIES surrounding Northampton, Penn., have been installing dust collector equipment in pursuance of a deadline set by the borough council of July 1. Coplay Cement Manufacturing Co. reported installation of dust collecting equipment in the raw mill was progressing. Other companies involved are Universal Atlas Cement Co., Lawrence Portland Cement Co., and Whitehall Cement Co.

Open Quarry

W. O. HOMER, Junction City, Kans., and James W. Storms, Jr., Kansas City, Mo., contractors, have purchased the crushing plant formerly operated on war work at Fort Riley, and will move it to Winfield, Kans., where an agricultural limestone plant will be set up. Production will be 60 t.p.h. L. E. Jaecke will be superintendent.

HINTS and HELPS

PROFIT-MAKING IDEAS DEVELOPED BY OPERATING MEN

Precast Concrete Gravel Silos

THE SERVICE ROCK CO., Riverside, Calif., is planning to build a new plant this Spring. It will have cylindrical concrete silos with the screening section over these bins. Precast concrete silo sections have been cast (see illustration) near the ready mixed concrete plant of this company's affiliate, the Concrete Rock and Sand Co. Molds provided by the nearby Concrete Conduit Co. plant are being used but the company is doing its own work. In the illustration may be seen sections of the silos being cured in a worked out area of the company's sand and gravel pit.

Precast sections of what will eventually be concrete silos for aggregates. Note interlocking sections and reinforcing

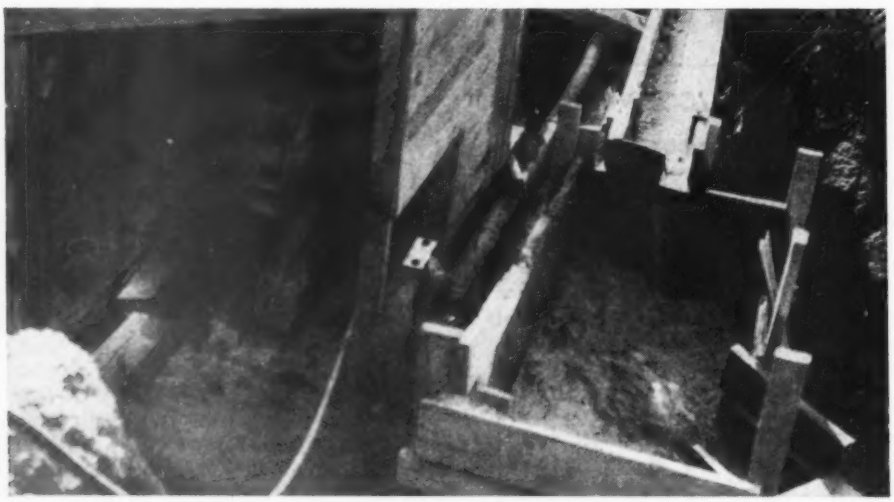
Recovering Stone Fines

A SIMPLE AND ECONOMICAL METHOD of reclaiming screenings from crushed stone operations where water is used on the final sizing screens is employed at the King's Mountain, N. C., plant of the Superior Stone Co. Water and fines passing the lower deck of the final screen is laundered to a sump where it is picked up by a 4-in. pump and delivered to a settling basin where the water is allowed to drain off to waste. The dewatered fines are recovered by shovel.

Drive Tunnel in Pea Gravel

ON THE PACIFIC COAST the use of 8- to 10-ft. diameter steel corrugated, sectionalized, pipe for supporting walls of reclaiming tunnels is quite common. It makes a cheap and very serviceable tunnel support. One operator has 3,000,000 tons of pea gravel that he wished to reclaim and grind in a Marcy mill for preparing additional concrete sand. To do this, and still use a reclaiming belt and tunnel, meant he had to drive a tunnel through the pea gravel, which is quite an accomplishment considering the "runny" nature of pea gravel. But this operator called into use some of the corrugated pipe and by mobile power units pushed it into the pile of pea gravel sufficiently far to suit his needs, a distance of some 30 to 40 ft. Then by mucking out the improvised tunnel he was ready to install his reclaiming belt.

Corrugated steel pipe driven into pea gravel stockpile



Fine screenings from sizing screens sprayed with water are laundered to sump and pumped to settling basin where they are reclaimed by shovel

Eliminate Air Leaks

By PAUL C. ZIEMKE

PLANT MAINTENANCE men like to pride themselves on the spic and span condition of the shops under their supervision. Such men will keep a close check on steam and air line leaks to the end that waste is stopped and proper pressures are maintained. Without full pressure pneumatic tools will not function at full efficiency and production suffers. Standard air pressures average about 90 lb. and when this value drops to perhaps 60 lb. the operating efficiency of the air operated tools drop off about 45%. This drop in production output is not readily noticeable and the absence of a guage at the production line lends no clew to the abnormal condition.

The causes for this low pressure are many and varied. It may be found that the air compressor is of too small capacity to keep up the pressure with the load placed on it. The volume of a constant speed compressor is fixed, hence any load added above its rated capacity tends to lower the pressure. Such an overloaded compressor may be running at dangerously high temperatures which decreases the output markedly.

In many cases the air compressor capacity is adequate yet the tools are handicapped through poorly designed or undersized distribution lines. An abundance of right angle fittings or small pipe will reduce the pressure at the work bench 10 to 15 lb. through friction even though the main gauge reads full pressure. Close attention also should be paid to any small leaks in the distribution line. While the individual tiny leak may appear of no consequence, the sum total effect is loss of a great deal of expensive air.

Practically all compressed air lines are shut off during idle hours hence the small insignificant leaks cannot be detected in the comparative quietness of the idle shop. A little time spent during shut down periods with full pressure on will prove to be a most illuminating experience. While it is the recommended practice to place numerous traps in the line to draw off condensate, it should be made a matter of maintenance routine to drain these at periodic inter-

vals rather than permit production to drain these and keep them dry by cracking the bleeder valve and leaving it in that position indefinitely. In an extremely noisy plant such bleeders may go undetected for years. Running the pressure up to pop-off value and noting the length of time this pressure is maintained after the machine is shut down will indicate the air tightness of the line.

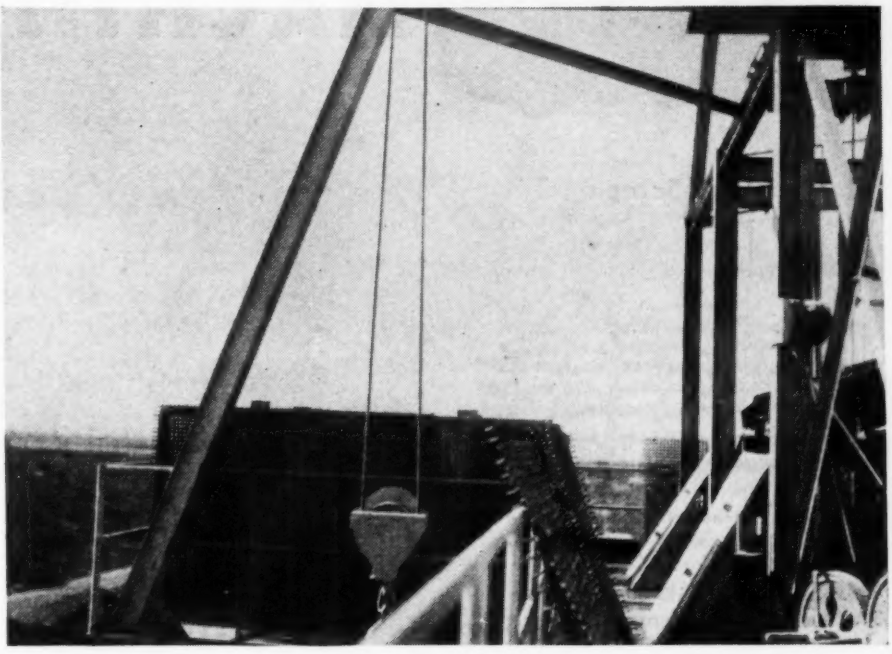
Last but certainly not least in considering air line losses and operating efficiency of air tools is the obstacle of entrapped moisture. This moisture content, of course, varies with the climate over a broad range and in accordance with the seasons. For example, with the temperature at 90 deg. F. and the humidity at 80, the water content of 100,000 cu. ft. of air is 20.35 gal.

As humid air passes through the compressor the moisture is condensed out by the compressing action. The larger portion of this moisture is eliminated by passing the air through the after coolers. The efficiency of these after coolers can be seriously affected by foreign matter in the cylinder jackets or the supply line of the coolant. The temperature of the coolant is also an important factor. High cylinder temperatures are conducive to large cylinder lubrication oil consumption, the formation of carbon on the piston and valves, and the release of carbon monoxide in the exhausts of the air operated tools. The author witnessed the explosion of a 4- x 10-ft. receiver tank that exploded with violent force due to the presence of volatile vapors and an incandescent particle of carbon. This receiver had been weakened by the presence of condensate left in over long periods which caused electrolitic action that caused the metal to deteriorate without noticeable effect on the outside surface.

An excess of water in the distribution lines can be a serious freezing hazard in cold climates and the water tends to wash out the lubricating oil supplied to the tools. The result is sluggish operation with rusting and accelerated wear of the parts. Some plants in the deep South have provided traps with cast iron inserts in which dry-ice (CO_2) or liquid nitrogen is stored which causes the moisture in the passing air to congeal on the surface of the containers thus providing 100% water entrapment and cooling as well.

Crane for Handling Screen and Repair Parts

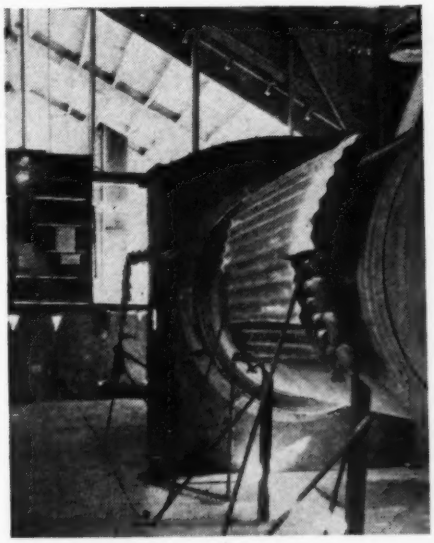
AT THE NEW PLANT of Azusa Sand and Gravel Co., near Azusa, Calif., a structure has been provided that requires a minimum of labor. The main unit is of massive concrete and steel with the screening sections mounted over the concrete bins. There is plenty of headroom for all screens, and the plant is quite a high structure. To elevate repair parts and screens to the top section, a long steel mast has been provided along with a suitable boom. This mast is the highest part of the plant. A small Hercules power hoist is mounted on the top deck of the plant adjacent to the mast, constituting a crane to raise or lower any items quickly and with a minimum of labor.



Mast and boom assembly of crane to raise materials to top of sand and gravel plant

Oil Preheater

AUBURN LIME PRODUCTS CO., Auburn, Calif., uses an oil of high viscosity at its new lime burning plant. The oil is delivered to the plant by trucks and stored in a steel tank holding 25,000 gal. In this tank are steam coils to preheat the oil. However, just before the oil reaches the burner, a second preheater has been installed. It consists of a series of 1¼-in. dia. pipe coils about 4-ft. long, comprising 14 lengths or a total of 64 ft. of pipe. The coil assembly is mounted near the hot end of the kiln and is partially covered with a corrugated iron shield. This additional coil heats the oil to a temperature of 160 deg. F., and permits economical use of oil and results in a steady, uniform and smokeless flame. The rotary kiln was formerly used in a quicksilver recovery plant and was designed by H. W. Gould Co., San Francisco. Its use in a lime plant is a logical extension of the use to which it was formerly employed.



Oil preheater for lime plant

Log Chain for "Come-Along"

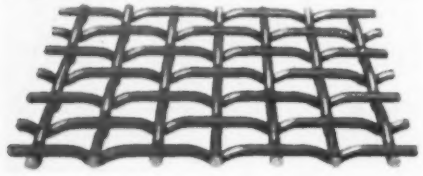
WHEN it comes to handling steel cables, the modern logger is the tops in efficiency. These men hold cable-splicing contests, and a well-trained team can throw a long splice in a 2-in. steel cable in a matter of minutes.

A western aggregates producer, using an aerial tramway was having troubles with an inefficient tram crew so he called in a friend familiar with the logging industry. Things began to move after that. One stunt introduced was the elimination of "come-alongs" or clamps for temporarily holding steel lines while making a splice. To pull up the slack in a 2¼-in. sky-line, this worker made three half-hitches over the sky-line, using an ordinary ⅝-in. steel logging chain, hooked a tractor onto the chain and pulled up the slack and held it until the splice was completed. The chain did not slip even a fraction of an inch and saved a lot of time.

new MACHINERY

Flat Surface Screen

JOHN A. ROEBLING'S SONS CO., Trenton, N. J., has come out with its Roe-Flat aggregate wire screen which is



Heavy screen manufactured to present a flat surface

designed to provide maximum metal surface exposed to abrasive wear. Its flat surface is said to evenly distribute wear, increasing screen life, and providing precision openings. Another advantage claimed for this screen is that its flat surface tends to eliminate clogging or blinding. The screen also is said to be very effective as a supporting surface for a fine mesh screen.

Portable Crushing Plant With Hammermill

IOWA MANUFACTURING CO., Cedar Rapids, Iowa, has announced a portable crushing and screening plant in which a large capacity hammermill is the crushing unit. The principal advantage claimed for this plant is that both agricultural limestone and roadstone may be produced in large volume. Either the 3033 or the 4033 Cedarapids hammermill may be used in this portable plant. With the larger size hammermill, this plant will produce 20 to 40 t.p.h. of agstone or 140 to 180 t.p.h. of 1½ in. material, depending upon the size of feed and kind of stone. When both products are desired, the portable hammermill plant will produce a substantial percentage of both, all in one closed cycle operation. A separate power unit is used to drive the hammermill so that it is possible to change the speed to suit hammermill performance in various kinds of stone. A smaller, independent motor drives the screens and conveyors, maintaining constant speed for maximum production.

Equipment included in this portable plant, in addition to the hammermill (see p. 96 January, 1947 ROCK PRODUCTS), is as follows: a 30-in. reciprocating feeder, a 6- x 6-ft. charging hopper, a 30-in. channel type feeder 30 ft. long, a double-deck 4- x 12-ft. screen, a similar return conveyor, and an elevating wheel.

Portable hammermill crushing and screening plant in action

Portable troughing belt type loader-unloader with a capacity of 60 t.p.h.

Loading Developments

BAUGHMAN MANUFACTURING CO., Jerseyville, Ill., has announced the addition of four types of loading and unloading equipment to its "Hi-Speed" line.

A compact vertical belt-bucket type loader has been designed specifically

Vertical belt bucket loader

for sites where vertical loading is required with limited space for installation. Heights from 10 to 75 ft. are available, and elevating speed up to approximately 60 t.p.h. is attained.

Another development is the "Kole King," a heavy duty drag chain type loader, designed primarily for handling coal. It has a self-feeding feature whereby the material is picked up direct from the pile with a minimum amount of shoveling required. A companion model to the Kole King is the "King Kole," which can unload cars either above or under the rails, and in combination the other unit will convey material from the car and pile it in a half-circle 90 ft. long.

The new "Speed Conveyor" is a portable troughing belt type loader-unloader capable of moving material approximately 60 t.p.h. It is said to easily handle abrasive substances; such as, sand, crushed rock, gravel, coal, etc., and has a self-cleaning belt and self-cleaning end pulleys.

High Speed Dozer

R. G. LeTourneau, Inc., Peoria, Ill., has brought out its rubber-tired Model C. Tournadozer powered by a 160-hp. Diesel engine. It has four forward speeds ranging up to 12 m.p.h., with the same four speeds in reverse, and has a Tournamatic constant-mesh transmission to meet the requirements of heavy work. With this transmission, the operator can

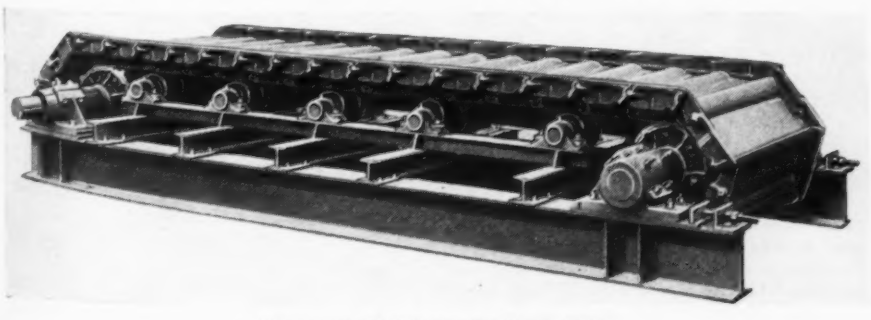
Easily maneuverable dozer has air-actuated disc clutches and brakes controlling two wheels on each side

select any gear ratio or change from forward into reverse with no shifting of gears and no loss of momentum. The operator steers by use of air-actuated disc clutches and brakes controlling the two wheels on each side. The bowl is cable-controlled and is operated by an air-actuated power unit. This new equipment has a wheelbase, 5 ft. 11⅝ in.; length, 15 ft. 2 in.; height, 7 ft. 11 in.; width of blade 11 ft. 3 in.; height of bowl, 44 in.; height blade can be raised above ground 44 in.; and blade can be lowered an unlimited distance, according to the manufacturer. It can be used for stripping, stockpiling, materials handling, feeding hoppers, and many other uses.

High-Capacity Feeder

Pioneer Engineering Works, Inc., Minneapolis, Minn., has developed an improved Pioneer-Oro manganese feeder as licensee under patents of Kensington Steel Co. This feeder is constructed to handle at high capacity large tonnages of abrasive materials such as broken stone at quarries.

The apron consists of a series of Oro Supermang double beaded, overlapping and interlocking pans with vertical reinforced side flanges. Under sides of the pans are heavily ribbed to withstand impact and shock, and side flanges are designed to reduce leakage of fines to a minimum. One-piece links, cast as part of the pans, serve as the chain links and present a continuous flat surface for carrying the apron over a series of rollers. This feeder can be secured in pan widths from 36 in. up to 48 in., and in lengths from 6 ft. 3 in. to 16 ft. 9 in., center to center of shafts.



Manganese steel feeder for heavy duty

Shovel of 1½-cu. yd. capacity has large diameter clutches, and is fitted with anti-friction bearings

High Temperature Concrete

The Babcock & Wilcox Co., Refractories Division, New York, N. Y., has announced development of a concrete which withstands temperatures as high as 3000 deg. F. Known as B & W Kaocast, the refractory material is said to have excellent stability and resistance to spalling under repeated heating and cooling cycles. It may be poured into place like ordinary concrete used in construction work or be used as a ramming mixture in furnace construction.

Rayon Cords in V-Belts

The B. F. Goodrich Co., Akron, Ohio, reports that rayon is now being used as the reinforcement, or tension member of all its light duty and automotive V-belts. Tension members are the parallel groupings of cords which carry the load in a V-belt.

Air-Controlled Shovel

Lima Locomotive Works, Inc., Lima, Ohio, has brought out a 1½-cu. yd. shovel, crane and dragline, known as Type 604. The boom is of box-type, electrically welded steel construction with wide flaring base. The dipper handle is a single unit with one-piece racking. It is equipped wth an independent chain crowd.

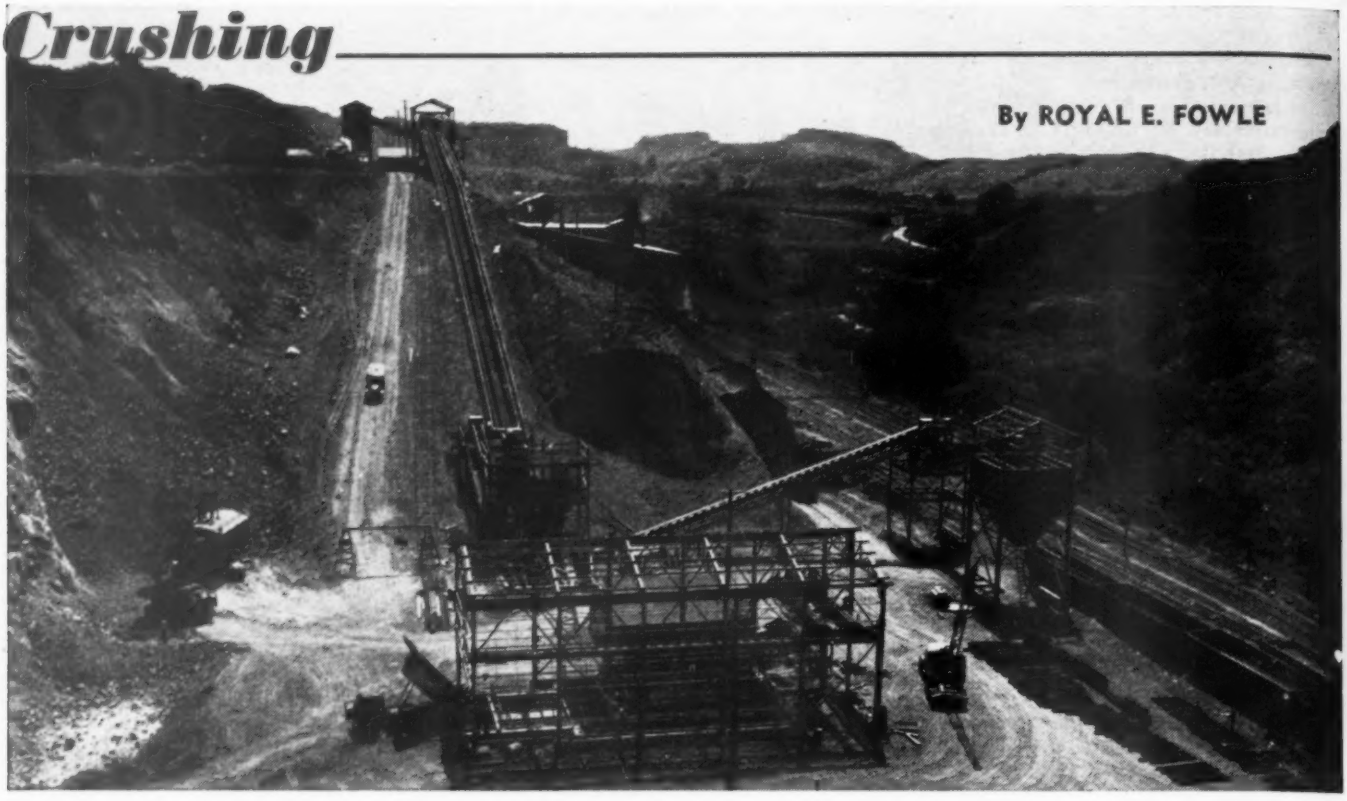
When working as a crane, the machine has a capacity of 30 tons at 12-ft. radius. Dragline capacities are variable depending upon boom length and nature of work. The crawler truck construction is the small, dolly roller type with end drive principle. Each belt is independently driven by a heavy sprocket chain housed under the treads. All rollers are equipped with piston-ring type seals for retaining lubricant and the protection of the bronze bushings. The truck base is a one-piece casting with center pintle, axle supports, conical roller path and gear case cast integral. Four conical hook rollers, equally spaced, support the rotating unit.

Steering is accomplished with the rotating unit in any position through precision air-controlled clutches. The rotating frame is of welded steel construction. Air control is used on all major functions, including steering, swinging and propelling, hoisting, crowding and retracting, boom hoist, dipper trip, and shift from swing to propel and the swing brake. The power plant consists of either a Diesel engine or electric motor.

Gypsum from Lime

During the war there was such a scarcity of gypsum in Sweden that gypsum was made from lime and sulphuric acid. High calcium lime is abundant in Sweden, and the acid was obtained as a waste product from the manufacture of T.N.T. The gypsum is of high purity and was used for surgical, industrial, and chemical purposes. Although the process is costly in comparison with natural gypsum, it is expected that production will be continued as a by-product in the utilization of waste sulphuric acid.

By ROYAL E. FOWLE



New primary crushing and screening plant serving quarry opened at track level. In the foreground may be seen truck dumping to primary jaw crusher, No. 1 screening tower in the immediate foreground with carloading bunker to the right, and long conveyors inclining up to No. 2 screening tower with sizing screens in old plant below

Open New Plant at Lower Quarry Level

Granite Rock Company's new primary screening and crushing plant and quarry reduces drilling and blasting costs and improves storage facilities

AFTER more than 47 years of continuous operation, the Granite Rock Company, Watsonville, Calif., suspended activities at the old quarry and started production in a new quarry and primary crushing plant at a lower level. The rock face of the new quarry is over 100 ft. in height, reaching from the Southern Pacific Co. track level up to the floor of the old quarry. These new operations, which are at Logan in Chittenden Pass, form an important addition to the company's crushing and screening plants.

The crushing and screening equipment consists of a 48- x 60-in. Allis-Chalmers jaw crusher powered by a 200-hp. motor, and two heavy-duty, 6- x 16-ft. triple-deck Robins Gyrex, rock-sizing screens. The final plant design was made by the Stephens-Adamson Mfg. Co.; the concrete structures design was prepared by J. B. Wells, consulting structural engineer; concrete pit and tunnel construction was done by Wells Goodenough, contractor; and steel erection was carried out by the Bos Construction Co., sub-contractors for the Stephens-Adamson Mfg. Co. Most of the motors and all control and distribution equipment was furnished by the Westinghouse Electric Mfg. Co. All belt conveyors and no-pressure, rubber troughing rolls were furnished by the B. F. Goodrich Co.

Royal E. Fowle, engineer and production manager, Granite Rock Co. He is a member of the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, and American Concrete Institute

Former quarry and plant operations could be resumed within 24 hrs., in case of a major mechanical failure in the new plant or due to an abnormal demand, as the track system of the upper quarry and all of the crushing, screening, re-sizing, washing and loading facilities formerly used have been retained. Located at the upper quarry are the heads of chutes where cars of quarried rock were formerly dumped to gravity feed a No. 7½ and a No. 8 McCully crusher plant. (see ROCK PRODUCTS, February, 1924 and December, 1945)

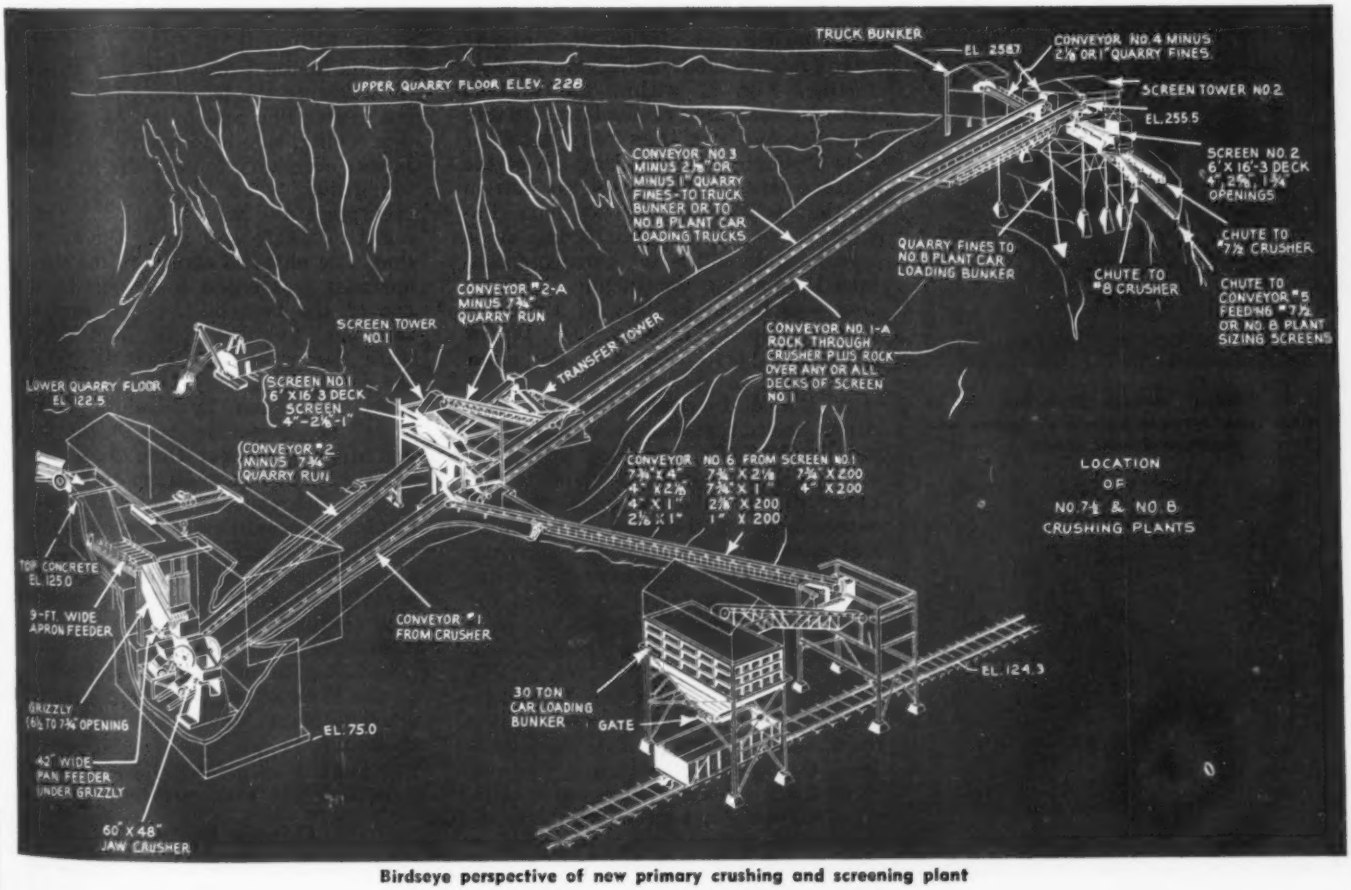
These chutes now serve as surge bins or bunkers for the crushed rock conveyed up from the new jaw crushing plant. The No. 7½ and No. 8 gyratories now operate as secondary crushers; the 48- x 60-in. jaw crusher acting as the primary.

Opening the new quarry and installing the large jaw crusher in a new plant were desirable for several reasons. Higher costs due to power

Fig. 1. View showing upper or 100-ft. level and beginning of cut down to lower or Southern Pacific track level. The middle or 75-ft. level had not been started

shovels setting out oversize rock during quarry car loading, and reducing these by "bulldozing," and delays due to the manipulation or removal of large rock at the primary gyratory crushers made the use of a large jaw crusher desirable.

The old upper quarry face had become considerably less in height after quarrying operations carried the face through the peak of the granite dome which marks the deposit. Drilling and blasting costs would be reduced because of the higher new quarry face, a face which in time will meet the old one above. The concentration, at this lower level, of all quarry and primary crushing operations along with the commercial car loading would be advantageous. Being located at the Pajaro Gap, the most constricted pas-


TRUCK BUNKER
EL. 258.7
CONVEYOR NO. 4 MINUS 2⅛ OR 1" QUARRY FINES
UPPER QUARRY FLOOR ELEV. 228
SCREEN TOWER NO. 2
EL. 255.5
SCREEN NO. 2 6' X 16'-3 DECK 4" 2⅛" 1¾" OPENINGS
CONVEYOR NO. 3 MINUS 2⅛" OR MINUS 1" QUARRY FINES - TO TRUCK BUNKER OR TO NO. 8 PLANT CAR LOADING TRUCKS
CHUTE TO "7½ CRUSHER
QUARRY FINES TO NO. 8 PLANT CAR LOADING BUNKER
CHUTE TO "8 CRUSHER
CHUTE TO CONVEYOR "5 FEEDING "7½ OR NO. 8 PLANT SIZING SCREENS
CONVEYOR "2-A MINUS 7¾" QUARRY RUN
SCREEN TOWER NO. 1
TRANSFER TOWER
CONVEYOR NO. 1-A ROCK THROUGH CRUSHER PLUS ROCK OVER ANY OR ALL DECKS OF SCREEN NO. 1
LOWER QUARRY FLOOR EL. 122.5
SCREEN NO. 1 6' X 16' 3 DECK SCREEN 4"-2⅛"-1"
CONVEYOR "2 MINUS 7¾" QUARRY RUN
CONVEYOR NO. 6 FROM SCREEN NO. 1
7¾" X 4" 7¾" X 2⅛" 7¾" X 200
4" X 2⅛" 7¾" X 1" 4" X 200
4" X 1" 2⅛" X 200
2⅛" X 1" 1" X 200
LOCATION OF NO. 7½ & NO. 8 CRUSHING PLANTS
TOP CONCRETE EL. 125.0
9-FT. WIDE APRON FEEDER
CONVEYOR "1 FROM CRUSHER
EL. 124.3
30 TON CAR LOADING BUNKER
GATE
GRIZZLY 6½ TO 7¾" OPENING
EL. 75.0
42" WIDE PAN FEEDER UNDER GRIZZLY
60" X 48" JAW CRUSHER

Birdseye perspective of new primary crushing and screening plant

Fig. 2: Cable-drawn quarry cars were operated during opening of quarry and construction of new crushing plant

Fig. 3: Digging the 18-deg. incline within the plateau

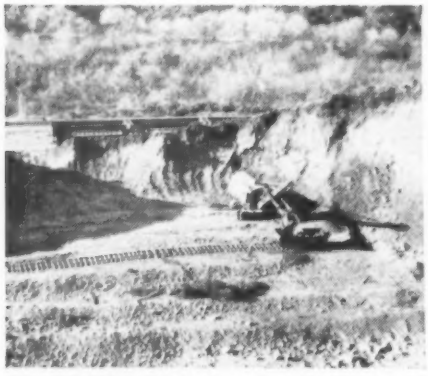


Fig. 4: "Holing" through protecting rib of plateau lying between bottom of incline and Southern Pacific tracks

Fig. 5: Pilot cut for each of the lifts required shovel to stand nosed down the 30 per cent grade

sage of Chittenden Pass, the quarry and plant operations have always been handicapped by lack of ground room. A new low level quarry would eventually uncover sufficient floor area so that all plant operations along with storage piles could be placed there. As it is now, lack of space makes it necessary to locate stock piles over 3500 ft. away from the crushing plants. (see ROCK PRODUCTS, July 1940)

Future Plans

Plans for the future call for new secondary crushing and screening plants, surge piles, overhead conveyor and tunnel-conveyor ground storage of sized rock along with resizing-washing-dewatering-car loading facilities; all to be located on the new quarry floor area which will be developed as quarrying operations progress.

With these various ideas and plans in mind, the following method of reaching the lower level was evolved. The existing quarry floor, forming a steep-sided plateau 100 ft. above the required plant elevation made it necessary to cut through to this lower level, Fig. 1. Blasting operations and falling rock could not endanger Southern Pacific Co. men or properties or the men and operations of the Granite Rock Co. Normal quarry and plant operating conditions, Fig. 2, must continue until such time as the new primary plant could be completed and then quickly cut in to the existing plants. The rock excavated during the descent, along with that dug to develop a working and plant area below must go through the existing plants.

It was decided to dig an 18 deg. incline, Fig. 3, within the plateau until the elevation of the lower quarry was reached and then "day-light" or hole through the protecting rib of the plateau left lying between the bottom of the incline and the Southern Pacific tracks, Fig. 4. The 18 deg. slope was used to allow for conveyor construction along the incline. Excavation was begun in July of 1940 and it was completed in May, 1945. It was not until April, 1946 that the plant was placed in operation.

A Meade-Morrison 365-hp. double drum hoist, for main and back line, was used to haul two 5-cu. yd. Western dump cars up this slope to the upper quarry and to the same rock chutes used by the locomotive-hauled rock cars during normal upper-quarry operations. These last named cars operated on a circular track except for a length of tangent for car dumping at the rock chutes. The track to the lower level was a prolongation of this tangent, Fig. 10, requiring a switch and a frog to enter at the circular track. Consequently, the two cars from the incline must enter the circular track system yet the cable pulling them could not interfere with normal locomotive-drawn traffic. This cable was placed under the outside rail of the curve near the hoist house, Fig. 6, then down the center line of the tangent and through the rail close to the frog near the incline.

During hauling operations a backline was attached to the rear car as it reached the top of the incline and entered the flat grade to the chutes. After the cars were dumped, they were returned to the top of the incline by the backline which was then unhooked, Fig. 7, the gravity return of the cars down the incline to the shovel being controlled by the main or hoist line.

Excessive backline slack and whip was eliminated by running the cable in covered troughs, Fig. 8, located between supporting sheaves. The cable was supported by this trough when slack; it cleared the trough bottom by one inch when loaded, thus preventing trough and cable wear.

Rock Car Loading

The two 5-cu. yd. cars were loaded directly behind the Bucyrus 75-B shovel or side-loaded as shown in Fig. 9. Excavation to the new quarry was made in three lifts or stages, but the crusher pit excavation was handled separately. Shovel loading of rock on a grade of approximately 30 per cent made severe demands not only on the shovel, but also upon the operators. However, the 75-B Bucyrus with Ward-Leonard Control proved to be well suited for such severe service. The main or pilot cut for each of the lifts required that the shovel stand nosed down the 30 per cent grade, load and swing an average of 180 deg. to the two 5-cu. yd. cars placed directly behind it, Fig. 5.

This inclined pilot cut was widened by throwing the track to either side of cut center line and by an average 90-deg. swing, side loading the rock cars. It was necessary to back the shovel up the grade, when blasting operations took place and also to back it up each night to a safe spot along the excavation. The physical strain on the shovel operator was eased somewhat by the use of the best bucket-type seat obtainable. Vertical drill hole depths were computed for blasting during the descent; most of the drilling, however, was done by loading "snake holes" set in at the toe of the face and slightly steeper than the incline.

After final excavations were completed, the crusher foundation containing approximately 225 cu. yd. of reinforced concrete was poured. A heavy copper sheet was placed horizontally in and around the crusher base to form a water-tight accordion membrane with the crushing plant foundation, a foundation which serves as the floor of a 50-ft. deep concrete pit. The plant, which is a steel frame structure, is set within this pit and was kept independent of the concrete structure wherever possible.

Quarry Material

The quarry is located at a granite dome that was formed by the upward

"intrusion" of a great molten mass. As the mass of granite cooled the outer portion of the "intrusion" contracted, cracked and split; the still hot and molten material down deep in the center was squeezed up into these cracks to form the numerous vein-like sheets that now cut and criss-cross the granite in the quarry walls. The "dikes," as they are called, represent the last dying stages of the molten mass, and are different composition than the enclosing granite. Some of them are almost white, some are almost black, depending upon the light or dark minerals of which they are composed. The light "dikes" are mostly quartz (rock crystal) and feldspar; the dark are largely hornblend.

The quarry face has a light-brown to blue-grey appearance, depending on the degree of iron oxidation from the hornblend, which makes up much of the dark particles in granite. The granite itself is a mixture of quartz (rock crystal), feldspar and hornblend. The water seeping down through the fractured granite dome over millions of years furnished most of the oxygen for the iron oxidation.

Cracking and splitting that took place when the mass cooled combined with heavy and severe earth movement over millions of years caused the dome to be well broken up. The maximum size pieces weigh about 15 tons. Careful attention must be paid in the plant operation to the removal of quarry fines. These fines are not overburden but consist of pieces of crushed and ground-up granite found between the larger pieces that make up the deposit and show clearly in the quarry face. The smaller portion of these quarry fines becomes quite sticky when damp or wet and adhere readily to chutes, belts, pulleys, etc.; consequently, the chutes, transfer points, bunkers, conveyor drives, etc., must be designed accordingly.

Drilling and Blasting

Comparatively low powder costs have resulted from the shattered and broken state of the deposit; costs which otherwise might have been prohibitive. It is only necessary to use toe holes or snake holes at the base or toe of the quarry face. These are put in by a Gardner-Denver wagon drill to a depth of about 24 ft. These holes are sprung so they will contain a charge of from 5 to 8 boxes of 40 per cent Nitro Starch Trojan powder. Several holes are usually shot simultaneously bringing down the quarry face in sizes that can be handled by the power shovels. Nitro-glycerine powder (gelatine) is used when water is encountered. Rocks too large for the crusher are set out by the shovel operators and later blasted when the shovels are in the clear or they are shipped as heavy rip-rap.

Quarry Operations

Two shovels are used in the quarry rock loading operations, a 2½-cu. yd. 75-B Bucyrus and a 4-cu. yd. 100-B Bucyrus. A Model 37 Marion is used as a standby and for development work. A Model 50-B Bucyrus (Diesel) is used as a crane for rip-rap loading or as a shovel for development work. The 75-B is Ward-Leonard controlled and operates on 440 volts. The 100-B, also a Ward-Leonard machine, operates on 2400 volts. The Model 37 Marion is rheostat controlled and operates on 440 volts.

Trucks of 12- and 20-cu. yd. capacity are being used for rock haul from the shovels to the jaw crushing plant. These will be used until such time as sufficient floor area has been developed to allow for locomotive rock-car transportation. At the present time the trucks lend themselves to very flexible shovel loading at the quarry face, particularly for rip-rap production.

Crushing Plant

The new plant, Fig. 11, consists of a receiving hopper located over a 9-ft. manganese steel feeder, a heavy manganese steel-capped bar grizzly and a 42-in. feeder for removing the material passing through this grizzly and a 48- x 60-in. jaw crusher, Fig. 12, for crushing the rock passing over it.

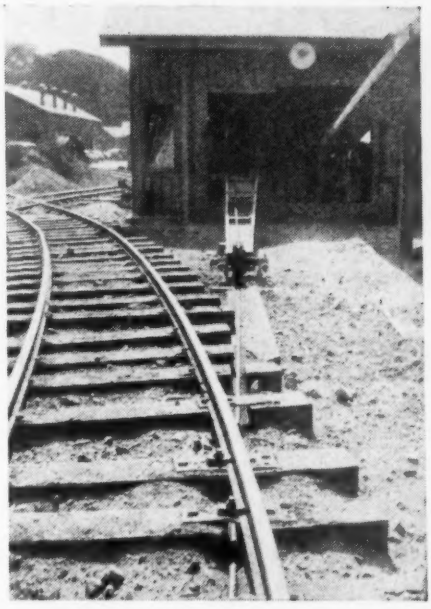


Fig. 6: Cable placed under outside rail of curve near hoist house

Material passing through the grizzly is run by its feeder onto a 42-in. conveyor (Conveyor No. 2) which carries it to a 3-deck, 6- x 16-ft. Robins Gyrex screen located in screen tower No. 1. This screen normally carries a 4-in. opening on the top deck, a 2⅛-in. opening on the second deck, and a 1-in. opening on the bottom. Rock passing over *any* or *all* decks can be sent on 36-in. conveyors (Conveyors No. 6 and No. 7) to a commercial carloading bunker, or it can be placed on a 36-in. conveyor (Conveyor No. 1-A) which also carries the rock crushed through the jaw crusher. This conveyor then carries the combined rock to a 6- x 16-ft., 3-deck Robins Gyrex screen, Fig. 13, located in screen tower No. 2, directly above the chutes leading to the No. 7½ and No. 8 secondary crushers. This screen normally carries a 4-in. opening on the top deck, a 2⅝-in. opening on the middle deck, and 1¾-in. on the bottom deck. The minus 2⅝-in. or minus 1¾-in. rock

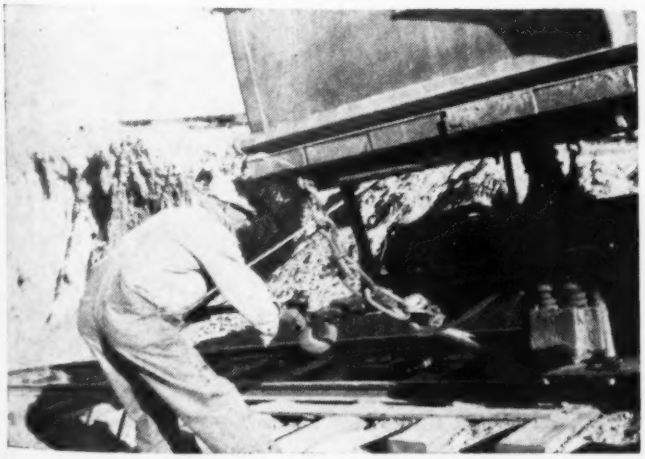


Fig. 7: Unhooking back-line attached to empty cars which were returned by gravity down incline

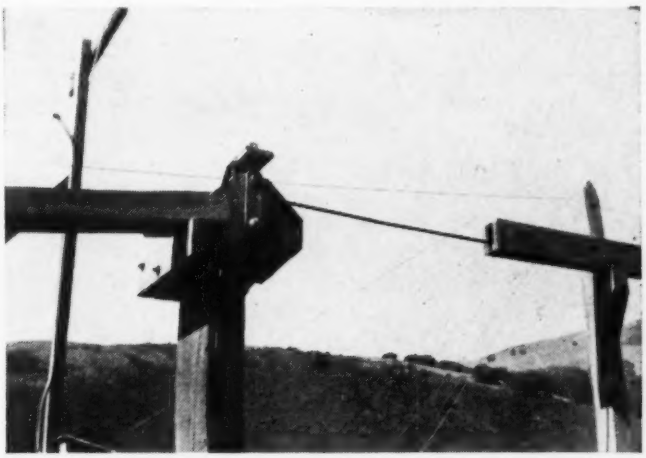


Fig. 8: Excessive backline slack and whip were eliminated by running the cable in covered troughs, located between supporting sheaves

Left to right: Kenneth Cooper, sales engineer; Robt. J. Cooper, district manager of Stephens-Adamson Mfg. Co., and A. J. Wilson, vice-president and general manager of the Granite Rock Co.

sizes can be sent directly to the plant sizing screen, the plus material going to either or both of the secondary crushers.

Removal of Quarry Fines

Quarry fines are removed at the first screening operation of the material which has passed through the bar grizzlies. These fines can be screened out in three sizes; through the 4-in. openings of the top deck, through the 2⅛-in. openings of the middle deck, and through the 1-in. openings of the bottom deck of the 6- x 16-ft. Robins screen located in screen tower No. 1. The maximum top size of material normally screened out is 2⅛-in., with considerable demand for the 1-in. maximum size. These sizes which are graded down to minus 200 are known as "Crusher Run Base." At times the 2⅛- x 1-in. and the 1-in. x —200 mesh increments of the 2⅛-in. x —200 mesh are screened and loaded separately; later to be recombined and mixed in a pug mill with the addition of water. The resultant product is known as "Slurry Mix Crusher Run Base."

Crusher Run Base, in 4-in. x —200, 2⅛-in. x —200 or 1-in. x —200 sizes can be sent by a 36-in. conveyor (Conveyor No. 3) and others to (1) a car loading bunker located in the No. 8 crushing plant, or (2) by a flap gate sent to conveyor No. 4 which feeds a truck loading bunker located on the upper or 100-ft. level. These same sizes of Crusher Run Base can be sent by conveyors No. 6 and No. 7 to the commercial car loading bunker. This bunker is equipped with a motor driven S-A Moore bin gate.

Shaped cast manganese steel chutes were installed at the crusher discharge to conveyor No. 1, the 42-in. feeder discharge to conveyor No. 2, and at the discharge of conveyor No. 1 to No. 1-A. Abrasive resistant "AR" steel liners of ½-in., ¾-in. or 1-in. thickness were installed at all other points of wear. The hopper over the jaw crusher was made of 3-in. plate, heavily reinforced. Accessability and ease of maintenance of all machinery, chutes, etc., was kept in mind during the design and construction of the new facilities.

High pressure water and air outlets were placed at frequent points for use in mist sprays, maintenance and cleanup. The plant is well lighted throughout and also contains well located plug-ins for lights and welding machines. The 200-hp. motor and drive for the 48- x 60-in. jaw crusher is totally enclosed in a pressurized structure. The air for this is supplied by a 2-hp. blower which brings in cool clean air from outside the crusher building. This blower action aids in cooling the crusher motor as well as

Fig. 9: Two 5-cu. yd. cars were side-loaded by the shovel. Excavation to the new quarry level was made in three lifts or stages

Fig. 10: Track to lower level was a prolongation of tangent for car dumping at the rock chutes. Note new conveyor structure and crushing plant under construction, below

keeping the motor-drive house free from dust.

Drainage is taken care of by two pumps set in a sump at the pit base and operating at two different float heights. A drainage system was also installed on the outside of the base to remove the hydrostatic pressure on the walls of the 50-ft. deep structure even though it was designed for such pressure. This relief is accomplished by means of a 6-in. pipe passing from the outside collecting system and through the main wall to the inside sump. The flow can be regulated by a valve set near the discharge into the sump.

Design of Conveyor Belts

Work of designing* the conveyors for the new plant system started on conveyors No. 1-A and No. 3, as these two belts presented the greatest problems. Conveyor No. 1-A, with a vertical rise of 135 ft. 6 in. on 508 ft. 5 in. centers with a peak capacity of 733 tons per hour of 16- x 2½-in. rock, presented not only a problem of strength necessary to elevate the load but a construction that would economically handle heavy rock after the fines had been removed. As this belt is only semi-permanent in that as soon as sufficient rock has been removed in the quarry to permit moving the rest of the plant into the present quarry, it will be discontinued, it was thought advisable to put on only such covers as might be expected to complete this phase of the operation. In other words, the perfect installation would be to have the belt completely worn out when the last ton of rock has been carried to the present plant. It was thought, however, advisable to leave ample margin of safety so that the belt would not have to be replaced before removal time arrived.

To carry this load, due to the large size of the rock, it was felt that the belt speed should not exceed 400 f.p.m. as this would simplify loading and help to eliminate the larger rocks bouncing on the belt while traveling at an 18 deg. angle. Calculated effective horsepower to do this job was 120. It was first thought that a tandem drive was indicated as this would materially reduce the slack side tension. This, however, was undesirable for several reasons; the first being that the quarry fines are quite sticky when damp and would adhere to the pulleys thus causing build-up. This would be quite objectionable on a tandem drive in that the difference in diameter of the pulleys working against the clean side of the belt as contrasted to the one working on the dirty side of the belt would cause one pulley or the other to carry a disproportionate part of the stress. It was also found that very little advantage could be gained in the way of

*Described by Harlon Lane, B. F. Goodrich Mfg. Co.

Fig. 11: Crushing plant consists of a receiving hopper located over a 9-ft. manganese steel feeder, a heavy manganese steel-capped bar grizzly, a 42-in. feeder for removing material passing through grizzly and a 48- x 60-in. jaw crusher, below. Electrical control panel above, to right

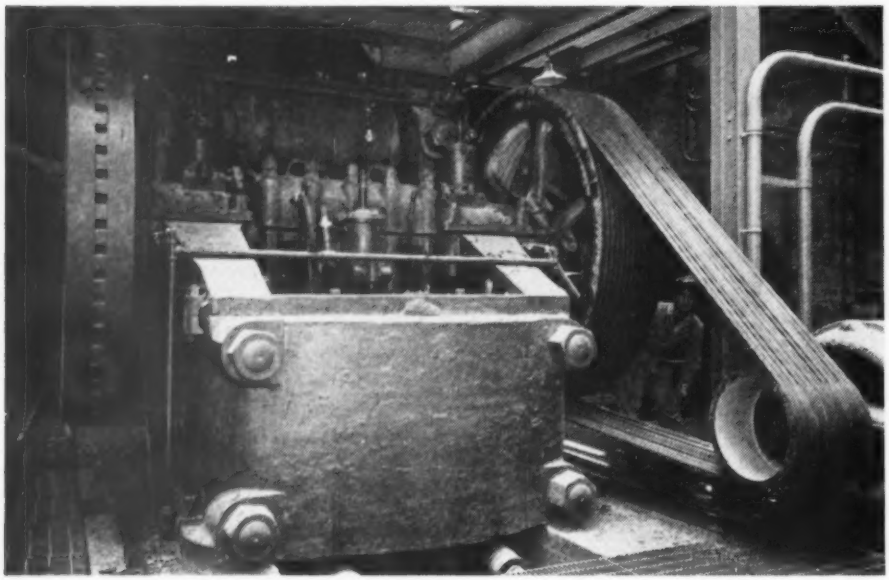


Fig. 12: Close-up of 48- x 60-in. jaw crusher with V-belt drive

slack side tension as the slope tension in the belt would exceed the tension necessary to make the tandem drive effective. It was determined that this slope tension would be equivalent to 2160 lbs. whereas a tandem drive would only require 850 lbs. to transmit this horsepower. It was, therefore, decided to use a single lagged head pulley with a 240 deg. arc of contact with the gravity takeup set immediately behind the head pulley, in which case 2975 lbs. of weight would be required to transmit the horsepower. This weight was also sufficient to overcome the slope tension of 2160 lbs. and keep the takeup from being raised by the slope tension.

To overcome any possibility of slippage when starting under full load the motors are across the line in starting, the actual gravity takeup weight being put in at 7925 lbs. and when carried on two strands of belt made a slack tension of 3963 lbs. Converting this into total tension, we arrived at 13,875 lbs. or converted into inch plys of belt, we arrived at 55 lbs. per inch ply for 7-ply or 48 lbs. per inch ply for 8-ply. Standard ratings for conventional type ducks indicated that a 42 oz., 8-ply would probably carry the load although it would probably be working at a slightly higher than recommended tension. This, however, raised another problem, and that was whether or not the belt would trough when running empty. It was determined that this type of duck will not trough satisfactorily in over 6-ply, and even the use of a step ply belt, that is 7 x 9-ply, would not solve the problem.

It was therefore decided to go to a cord construction manufactured by the B. F. Goodrich Co. as this belt seemed to meet the conditions encountered. The belt would not only trough when unloaded in as many as 12 plys, but it had sufficient strength to work at 55 lbs. belt stress, where 7 plys would satisfactorily do the job. In addition to the cost factor, the belt itself, with the fewer number of plys permitted the use of smaller pulleys with additional savings occurring in the speed reduction unit. Cord plys in the belt being free floating with no cross threads to hinder their movement under impact conditions, permitted these plys to work as a shock or impact absorbing unit equivalent to that much additional cover stock.

A transverse cord breaker, which is a ply of heavy cord running across the belt, was included in the top cover thickness to act as a further reinforcing agent, and help absorb the impact from the larger rock. At the same time this breaker doubled the cover adhesion to the belt carcass. It was also found that this transverse cord breaker in actual operation saved No. 2 conveyor from being ripped completely in two when a chute became plugged. The only damage to the belt was a tear of approximately 18 in. which was easily replaced by cutting out the bad section and revulcanizing the belt endless. The low stretch characteristics of the cord construction permits the belts being made endless with the takeups set two-thirds of the way from top which leaves sufficient belting in the takeup to be used for repairs of this nature.

The only other belt in which there was any serious problem was conveyor No. 3, which is 498 ft., center to center, with a 131-ft. vertical rise. As this belt carries a maximum load of 750 t.p.h., it was decided to make the two units identical as far as drive machinery was concerned, as the operating tension was almost identical. This belt, however, handling generally minus 2½-in. material, could operate satisfactorily with less cover thickness.

The final specifications were, therefore, as follows: Conveyors No. 1 and No. 1-A handled identical material and for the sake of simplification, used the same belt, 36-in., 7-ply, 5/16-in. top cover including transverse cord breaker, 3/32-in. back cover, including standard type breaker.

As conveyors No. 2 and No. 2-A are 42-in. and handle minus 10-in. rock mixed with fines, the carcass was reduced to 6 plys, and cover thickness was left the same as on conveyors No. 1 and No. 1-A.

With conveyor No. 3, although the

(Continued on page 140)

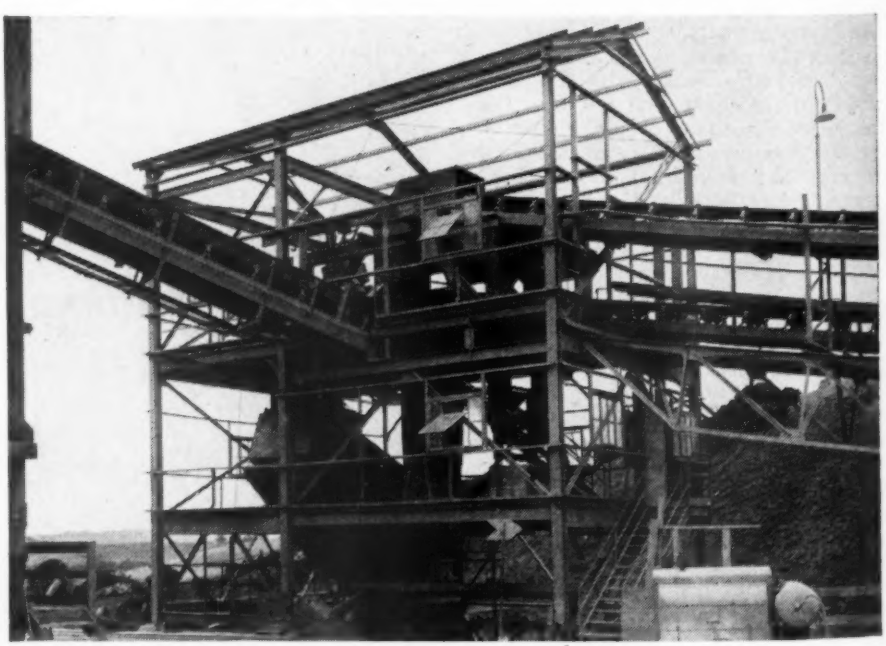


Fig. 13: Screen tower No. 2, showing conveyor No. 4 to truck bunker, to the left, conveyor No. 3, upper and nearest, carrying crusher run base to either conveyor No. 4 or to No. 8 plant, and lower conveyor No. 1-A, carrying rock from crusher and that screened in No. 1 tower from quarry run material passing bar grizzly. The screen is a 6- x 16-ft. triple-deck unit

LABOR RELATION TRENDS

"Portal to Portal Pay" Developments

By NATHAN C. ROCKWOOD

ALTHOUGH RELATIVE QUIET has settled over the discussion of the "portal to portal pay" issue, interesting developments are in progress. Incidentally the popular phrase "portal to portal pay" is something of a misnomer, for the genuine portal to portal pay issue, decided in 1944 by the U. S. Supreme Court in the case of the Tennessee coal miners, has never been questioned; and the miners, there and elsewhere, are collecting pay for the time they spend getting ready for work and traveling portal to portal.

It was the attempt of workers in ground level plants to extend the pay work day to include similar preparation and travel time that brought about the U. S. Supreme Court decision in the Mt. Clemens Pottery Co. case, with the resulting avalanche of C.I.O. unions' suits, totaling, it is said, some four or five billion dollars in claims for back wages with penalties. The A. F. of L., with more wisdom and experience, took the position that such extra pay should be a matter for collective bargaining.

Back to Supreme Court

The U. S. District Court at Detroit, Mich., to which the Mt. Clemens case was remanded by the U. S. Supreme Court, heard arguments not only of the company's and the Union's counsel, but also those of three "friends of the court;" that is, the U. S. Department of Justice, the National Association of Manufacturers and the C.I.O. The case was remanded not on points of law, but to determine just how much compensable time was involved; and if the trial court found this to be trivial (the de minimis rule) the courts were not to be concerned about the case at all. The District Court judge, after personal investigation of the conditions at the Mt. Clemens plant, decided the time involved in dispute was less than 12 minutes a day, and therefore trivial.

The issue is now ready for the docket of the U. S. Supreme Court to decide whether 12 minutes or less per day is substantial enough to require a back-pay adjustment. The District Court also raises the point that if the 12 minutes should be considered compensable working time, have the employees any claim beyond the time when the U. S. Supreme Court first decided that the time spent on the plant premises preparing for work is compensable.

Actual Walking Time

Whichever way the high court decides this case, and regardless of any new legislation by Congress to clarify the issue, there will be new collective contracts written, and this issue will have to be settled there; for it is doubtful if Congress can or even wishes to outlaw so-called portal to portal pay as a matter of consideration for collective bargaining. The fact is that some employers have already made contracts to include preparation time as compensable, and at least two employers we know of have made retroactive compensation terms.

Therefore, the decision of the U. S. District Court at Detroit in this second hearing of the Mt. Clemens case is worth study because it was a scientific and judicial attempt to find out the true amount of time that employes claimed to have spent in necessary preparation for their daily tasks. Whether the exact time that should be allowed as compensable in this particular case is determined by the U. S. Supreme Court or not, it will be something that must be determined and agreed upon if the matter is settled by collective bargaining contracts.

The Supreme Court in remanding the case implied instructions to the lower court to determine (1) how much walking time was involved in going from the time clock to the several respective work places; and (2) the time necessarily consumed in putting on overalls, aprons, removing shirts, taping or greasing arms, putting on finger cots, preparing equipment, etc. The Supreme Court also included two mandates: (1) that after such information was obtained the District Court must, in computing damages (back wages and penalties), apply the rule of "de minimis non curat lex" (the law cares not for small things); and (2) that the rule must be applied to a work week contemplated by Section 7 (A) of the F.L.S.A. (the Wage and Hour Law), "in the light of the realities of the industrial world."

Under these instructions, or the court's understanding of them, it could not consider time spent on the company's property other than that spent in walking from the time clock to the job locations and the preparations for work mentioned above. To determine the facts in the case, the distances from the time clock to all the work benches, etc., were measured, and by actual experiment the time spent walking was determined. This tabulation may prove as helpful as the decision itself in combatting similar claims elsewhere, because it proves the employes' estimates of time so spent were grossly exaggerated, as they are likely to be under similar circumstances. We don't list the whole tabulation, but here is a sample: "That at the rate of 2 miles per hour a man walks 2.93 ft. per second or 176 ft. per minute." The distance from the time clock to the farthest job site was 890 ft. by the longest way around, or 5 minutes walking time by the slowest man on the job.

In the same way the other preparatory motions at the job site were studied, and hence the "less than 12 minutes" a day arrived at, since these preliminary activities were found to total less than 3 minutes a day. Many of the activities listed in the original petition of the employes were indulged in only by a few. The court was unable to find any clue in previous decisions of the Supreme Court as to the limits of de minimis, so drew its own conclusion with the understanding that the Supreme Court would pass on this determination.

The decision went further and said that if the Supreme Court should decide that the compensable time leaving the job raised the total to more than the de minimis, it was believed that in all fairness to the defendant . . . it would amount to an unfair and unexpected penalty . . .to go back to the passage of the F.L.S.A., when the employer had relied in the meantime on interpretations of the administrator and the courts that its method of time keeping was approved. In other words the employer and many others like him had been acting in good faith.

Lone Star Cement Case

The only similar case decided since this, without waiting for a new Supreme Court decision, appears to be one in the District Court for the Northern District of Texas, in a suit brought by 67 employes of the Lone Star Cement Corporation, rendered February 17, 1947. The complaint was brought by the officers of the employes' union and was dismissed by the judge for want of particulars. The Court said, apparently sarcastically: "They do not tell whether a man worked or whether he didn't. They want me to find out, and I am not going to do that. The court does not have to do that. Let them set down how much they worked. It doesn't make any difference if a man did come there and punch the time clock, and took a bath, or whether he took a bath or did not, but if he went and coupled cars or greased things, he is entitled to that which he did. Now, whether after hearing the proof, whether taking a bath is for his convenience, that the bath tub was put there, that is another matter. He has a right to allege he worked that time, though, and then you know the issue you have to meet."

The judge evidently is not familiar with cement-plant bathing facilities, but his point is clear enough. His remarks do emphasize that in the stampede to enter suits under the portal to portal pay ruling, probably not only in this case but in many others, the petitioners neglected to prepare a case before rushing into court and many have been withdrawn. Probably every employer so annoyed has the right to demand a bill of particulars even before making it a subject for collective bargaining.

West Coast Convention Draws Big Attendance

Inspection trips to California plants, practical program, and entertainment voted outstanding Sand and Gravel and Ready Mix convention programs

SOUTHERN CALIFORNIA drew an attendance of 600 to the thirty-first annual convention of the National Sand and Gravel Association and the 17th annual convention of the National Ready Mixed Concrete Association the week of March 3d and to participate in a delightful program of entertainment. The meetings, held at Los Angeles' Biltmore Hotel, marked the first time either of the two industries had ever met in annual session in California, the selection of the location being in tribute to the outstanding accomplishment of producers on the West Coast to the advancement of their industries. Certainly everyone in attendance, and the ladies in particular, who participated in the program of entertainment provided by their California hosts will long remember the California producers for an extraordinary display of the traditional California hospitality.

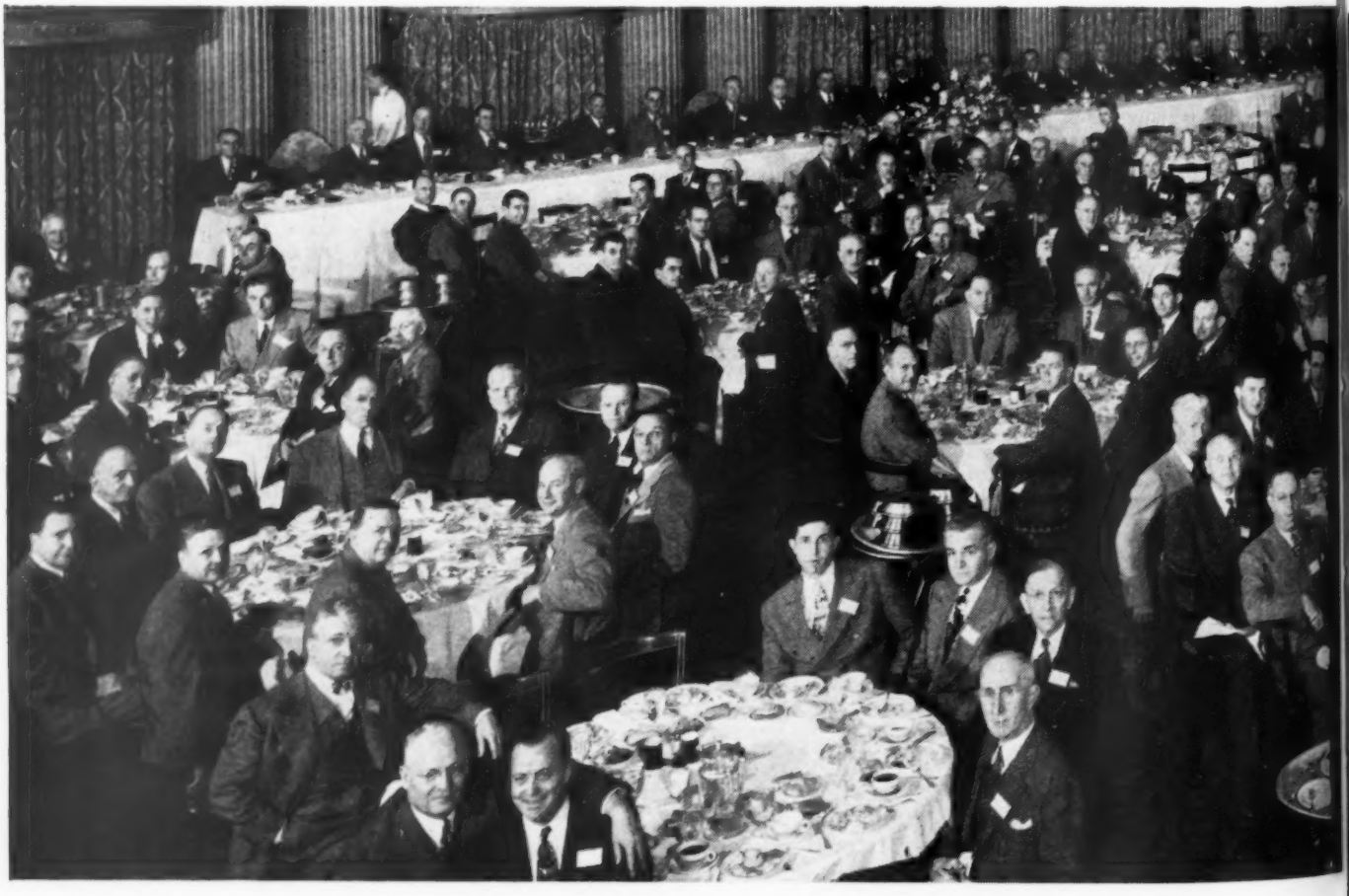
The program was unique, for these industries, in that two entire afternoons were set aside for the inspection of sand and gravel plants and ready-mixed concrete plants in the Los Angeles area; a full week of special entertainment was provided for the ladies; yet, a complete and comprehensive program of convention sessions was held, all within the space of one week. The first day, March 3, was devoted to separate meetings of the two Boards of Directors and the annual business session of the Manufacturers' Division; the reception by the Manufacturers' Division was held the evening of March 5; a night sightseeing tour was conducted for men and ladies on March 6 and the big majority spent the week-end following on a conducted Palm Springs-Riverside Tour.

Resolutions

The following resolution introduced before a joint session of the two associations by H. V. Owens, Utica, N. Y., and unanimously adopted, best expresses the reaction to the convention sessions and entertainment program:

"RESOLVED, by the members of the National Sand and Gravel Association and the National Ready Mixed Concrete Association, assembled in annual convention in Los Angeles, Calif., this 6th day of March, 1947, that we hereby express our abiding appreciation for the magnificent hospitality with which we have been received by the members of the Southern Cali-

Joint luncheon of the National Sand and Gravel Association and the National Ready Mixed Concrete Association



fornia Rock Products Association and the members of the Southern California Ready Mixed Concrete Association; and be it further

"RESOLVED, that we are indebted to the members of the Southern California Associations for the opportunity which they have given us of inspecting industry installations of the Southern California area and for the many other arrangements made in our behalf which have made this the most pleasant and most instructive annual convention in the history of our two industries, and be it further

"RESOLVED, that we acknowledge our appreciation for the thoughtful entertainment program which was provided for the men and women who have come to Los Angeles for this convention; entertainment features which have been most enjoyable and have made it possible for us to take back to our homes a most pleasant recollection of a delightful time made possible by our gracious hosts; and be it further

"RESOLVED, that we express our particular appreciation to the Committee on Convention Arrangements, of which Mr. Robert Mitchell was Chairman and Mr. H. G. Feraud was Executive Secretary, and to Mrs. W. J. Van Valkenburgh and Mrs. H. E. Bender, Chairman and Vice-Chairman, respectively, for the ladies entertainment and for the unremitting energy which they have shown in planning the convention and in making it such an outstanding success; and be it further

"RESOLVED, that this Resolution shall be spread on the permanent minutes of our two Associations."

Left to right: H. G. Feraud, Los Angeles, executive secretary of committee on convention arrangements of California associations; Charles W. Shirey, Waterloo, Iowa, retiring president of N.R.M.C.A.; V. P. Ahearn, Washington, D. C.; Paul C. Graham, Los Angeles, member of the Board of Directors; Abe Goldberg, Allis-Chalmers Manufacturing Co., Milwaukee, Wis., retiring chairman, Manufacturers' Division; and Richard N. Coolidge, Nashville, Tenn., president, N.S. & G.A.

Registration

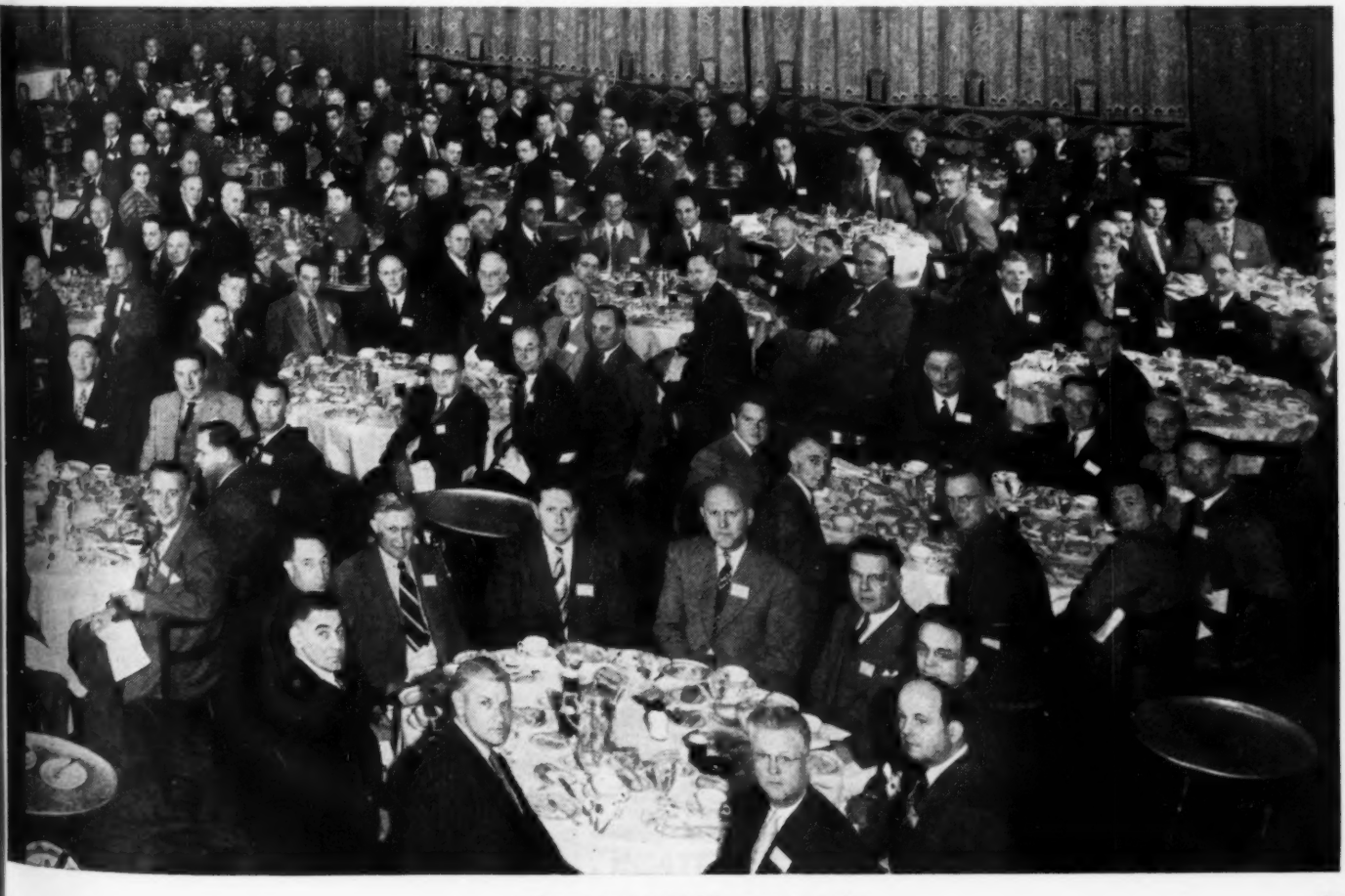
Space does not permit publishing the complete registration but an analysis of the list reveals very excellent representation geographically. Some 170 ladies were registered, and producers from 36 States were present at the convention sessions. From outside the United States came Montague A. Craven, Certified Concrete, Ltd., New Zealand; J. E. Weston, Diether, Ltd., Vancouver, B. C.; and Louis P. Price, Clarke-Halawa Rock Co., Honolulu, T. H.

Outside California, the largest delegation, 41, came from Ohio, followed next by Illinois, Pennsylvania, Missouri, Iowa, Wisconsin, New York, Texas, Indiana, Utah, Michigan, Washington, Oregon and Minnesota, in that order, as the leading States represented.

The program of business sessions was drawn up for joint sessions of the two Associations, in the consideration of topics of mutual interest to both industries and for separate, but not conflicting, sessions for each Association to consider problems peculiar to each of the two industries. Some of the papers and discussion specifically for ready-mixed concrete producers, and others of particular interest to those producers, are reported in CONCRETE PRODUCTS, a section of ROCK PRODUCTS within this issue.

Chairmen for Meetings

RICHARD N. COOLIDGE, president of the National Sand and Gravel Asso-



Opening session of the National Sand and Gravel Association with President R. N. Coolidge, presiding

ciation, presided over that Association's opening meeting the morning of March 4. The opening session of the National Ready-Mixed Concrete Association, the morning of March 5, was under the chairmanship of President Charles W. Shirey.

Following a joint luncheon, March 5, with ROBERT MITCHELL, past president of the National Sand and Gravel Association presiding, PAUL C. GRAHAM was chairman over a joint session largely devoted to legislative, tax and labor problems.

CARL R. OLSON presided over the technical session, for both Associations, the morning of March 6, and THOMAS E. POPPLEWELL was chairman of the concluding session, the afternoon of March 6, for sand and gravel producers. The concluding session for ready-mixed concrete producers, Friday morning, March 7, was under the chairmanship of President-elect, FRANK P. SPRATLEN, JR.

N.S.G.A. Officers

RICHARD N. COOLIDGE, Cumberland River Sand Co., Nashville, Tenn., was reelected president of the National Sand and Gravel Association. The other officers, also reelected, are T. E. Popplewell, Fort Worth, Texas, vice-president, and H. N. Snyder, Buffalo, N. Y., secretary-treasurer. Reelected to complete the executive committee are W. Agnew Bliss, Pittsburgh, Penn.; George W. Renwick, Chicago, Ill.; Eric W. Ryberg, Salt Lake City, Utah; and A. R. Shiely, St. Paul, Minn. Stanton Walker, Director of Engineering, and Vincent P. Ahearn, executive secretary.

Floyd C. Fuller, Portsmouth, Ohio; J. P. Eyre Price, Scranton, Penn.; Eric W. Ryberg, Salt Lake City, Utah; and Stephen Stepanian, Columbus, Ohio, members at large of the Board of Directors whose terms expired March 3, 1947, were reelected. Newly-elected to the Board is Charles E. Brady, W. R. Bonsal Co., Lilesville, N. C.

E. J. GOES, Koehring Co., Milwaukee, Wis., was elected chairman of the Manufacturers' Division, succeeding Abe Goldberg of Allis-Chalmers Manufacturing Co. R. C. Johnson, Simplicity Engineering Co., Durand, Mich., succeeds Mr. Goes as vice-chairman. Reelected vice-chairmen are E. C. Anderson, Kensington Steel Co., Chicago, Ill.; Morgan R. Butler, Butler Bin Co., Waukesha, Wis.; A. E. Conover, Robins Conveyors, Inc., Passaic, N. J.; W. W. King, The W. S. Tyler Co., Cleveland, Ohio; and G. K. Viall, Chain Belt Co., Milwaukee, Wis. O. C. Friend, Nordberg Manufacturing Co., Milwaukee, Wis., was elected to the Board of Directors, succeeding Mr. Johnson.

E. J. Goes, Koehring Co., Milwaukee, Wis., was elected chairman of the Manufacturers' Division, N.S. & G.A.

Future Meetings

The 1948 conventions of the National Sand and Gravel Association and the National Ready Mixed Concrete Association will be held in connection with the National Crushed Stone Association at the Netherland-Plaza Hotel, Cincinnati, Ohio, marking the resumption of machinery exhibits for the first time since 1942. Definite dates are yet to be announced.

It is the desire to hold exhibits in the future on an alternate year basis with the Road Show, which means that future expositions will be held in 1949, 1951, etc., but the manufacturers will exhibit also in 1948, in compliance with the desires of the

R. N. Coolidge, Cumberland River Sand Co., Nashville, Tenn.; Robt. J. Potts, Harlingen, Texas; J. P. Eyre Price, Wyoming Sand and Stone Co., Scranton, Penn.; and Robt. Mitchell, Consolidated Rock Products Co., Los Angeles, Calif.

two Associations to have the earliest possible opportunity to inspect new developments in machinery.

Mid-year meetings of the Boards of Directors of the N.S.G.A. and the N.R.M.C.A. will be held August 13-15 at French Lick Springs, Ind.

Safety Competition

V. P. AHEARN stressed the importance of safety and pleaded for greater participation in the annual safety competition sponsored by the National Sand and Gravel Association, in announcing the winners of the 1945 safety competition, for which ROCK PRODUCTS awards two trophies, one for the winner in the more than 100,000 man-hour size classification and the other for the best record with less than 100,000 man-hours worked.

V. W. BARLOW, Missouri Portland Cement Co., St. Louis, Mo., accepted the trophy for the company's Chelsea plant, Memphis, Tenn., commenting briefly on his concern's policy and evaluation of safety practices. Marquette Cement Manufacturing Co., Chicago, Ill., was not represented to receive its trophy for the perfect safety record of its Memphis, Tenn., sand and gravel plant, but had written an acceptance letter to Mr. Ahearn. The letter, which told the important part and detailed the value that safety work has in the company's overall operations program, was read to the convention.

Mr. Ahearn called special attention to the fact that two portland cement companies were leading the way in sand and gravel safety performance, paying tribute to the portland cement industry for the fine results it has accomplished in safety work.

Presidential Address

Opening the 31st annual convention of the National Sand and Gravel Association, President Richard N. Coolidge, in his address, gave some facts and figures on the State of California to acquaint out-of-State delegates with the growth and importance of California that have made it the second State in the Union and one in which there is a tremendous backlog of needed construction.

Mr. Coolidge paid special tribute to Robert Mitchell for his outstanding achievements as president of the Association in 1944 and 1945 and in particular for his remarkable success in building up the membership which has permitted improvements in Association work and in compensation to the Association staff from top to bottom.

The year 1946 was a year of progress in our economy, said Mr. Coolidge, climaxed by many substantial advances toward restoration of free enterprise as the basic principle of American business. It was a year of high national income and one in which we have already reached and passed the post-war goals of even the most optimistic economists, said Mr. Coolidge. The people of this country have reawakened to the realization that we have the world's highest standard of living because we have built upon the foundation of free enterprise and, he observed, recent developments indicate that we are returning to the original concept of a free nation, a land in which a man may rise as high as his will and his skill will permit.

Mr. Coolidge commented at considerable length on the subject of labor, the special privileges conferred upon labor organizations and pending bills in Congress that are supposed to correct unfair special privileges. He believes that industry does not want any so-called "drastic" labor laws but that labor unions should be brought within the legal framework which encloses all other organizations and citizens, and he believes that the Gwynne Bill is needed to protect the rights of industry against labor racketeers. It is highly probable, he said, that the ultimate and greatest service to organized labor and the public will be done by forcing labor to be fully responsible and liable for its own actions, just as industry is required to be.

We must demand economy in government but not at the sacrifice of our national preparedness and safety and, he said, it is high time to start work on paying the national debt.

Commenting further on the national picture, he said:

". . . the Association and the business men who are its body must unite with other fair-minded men to place the message clearly before the American public that something must be done quickly to stop the ghastly depletion of our economic strength. We cannot, as an Association, be apathetic as to the course of labor legislation. Labor should and must be protected against exploitation, whether that abuse comes from industry or its own so-called leaders.

Otto S. Conrades, St. Louis Material & Supply Co., St. Louis, Mo.

V. P. Ahearn presenting likeness of ROCK PRODUCT'S safety trophy to V. W. Barlow, Missouri Portland Cement Co., St. Louis., Mo., one of two winners of the N.S. & G.A. safety competition in 1945 at the company's Memphis, Tenn., plant. The actual trophy is of concrete with the likeness of the winning plant reproduced in color

"I firmly believe that the good of industry and the well-being of labor are one and the same thing. They can and will prosper together if allowed to work out their problems without governmental or foreign influences. The temper of Congress at present seems to be to take it slow."

". . . Let us fight for our rights and work diligently for corrective legislation which will, in plain language, guarantee the rights of management as well as labor. Let us demand that labor be made responsible by law for its own actions, with no tricks of legal interpretation by anyone. Let us put an end to judicial law-making. Work is work, and it must be productive to dignify the work. Any action by labor or management which is not for the public good must be stopped . . ."

The Association now has the finest membership in its history, said Mr. Coolidge, with a nine per cent increase in the past year to a total of 195 active members and 51 associate members. It has 25 active members in California and Arizona, due to the energetic efforts of Bob Mitchell in Los Angeles and Arizona and Ed. Goodpastor in northern California. As to representation, he said that more than 75 per cent of the commercial production of sand and gravel nationally is included in the membership.

VINCENT P. AHEARN and STANTON WALKER were singled out for special commendation. Particularly mentioned were Mr. Ahearn's activities as a member of the Labor-Management Advisory Committee to the Secretary of Labor and of the Industrial Relations Program Committee of the National Association of Manufacturers, and his appointment by President Truman as one of the two employer members of the United States Delegation to the Building, Civil Engineer-

Quentin W. Best, Consolidated Rock Products Co., Los Angeles, Calif., and P. J. Akmadzich, City Rock Co., Los Angeles, Calif.

ing, and Public Works Committee of the International Labor Organization meeting held in Brussels from November 25 to December 3, 1946.

Stanton Walker's activities on important committees of A.S.T.M., the A.R.E.A. ballast committees, on the Highway Research Board and other technical organizations were mentioned and he was congratulated on his very recent election to the presidency of the American Concrete Institute.

Mr. Coolidge expressed his thanks to Dr. H. C. Byrd, president of the University of Maryland, and Dr. S. S. Steinberg, Dean of Engineering, at Maryland for their interest and cooperation in the Association's research at that University. He concluded with an appropriate expression of thanks to the California producers for their convention efforts.

Executive Secretary's Report

EXECUTIVE SECRETARY V. P. AHEARN, in his annual report, touched upon the Association's activities in handling a vast number of industry problems and stressed the significance of some of the subjects to be considered in the various convention sessions.

Association finances are sound, he said, and the membership is the finest and most representative in the Association's history. He commented briefly on the important role that associate members play in the Association, in the solution of operating problems, and urged their attendance at annual conventions. Mr. Ahearn expressed his regrets that the convention hotel could not accommodate nearly all of the delegates.

In a brief consideration of construction and priority controls, Mr. Ahearn itemized the certain types of engineering projects excluded from controls over non-residential construction, including streets and highways, dams, reclamation, railroads, water and sewerage lines, etc., but, he said, buildings and streets necessary to such projects must come under order. The objective is to institute certain relaxation of restrictions on construction as materials, manpower and transportation facilities permit. As to priority controls, little is now left affecting the industry, but PR-28 is still important for some situations.

During 1946, the industry had more difficulty with new equipment and repair parts than anticipated, and quality of repair parts had deteriorated, said Mr. Ahearn, in commenting that the industry is desperately behind in plant expanson and rehabilitation.

The car supply situation remains serious. In January, 1946, the railroads had 870,347 cars of the open type; in December, 1946, they had 868,922, and the condition of all types continues bad, reported Mr. Ahearn. The box car situation is the most critical, with a decline of 15,606 cars in 12 months and prediction that replacements will not equal retirements before July, 1947. A bumper grain crop in 1947 may provoke a national crisis. Mr. Ahearn commented on the Association's effort the past year, in cooperation with the National Crushed Stone Association and the National Slag Association, in protest to freight rate increases that had been requested by the carriers. Information was developed, for the purpose of the case, which showed that the 20¢ per net ton sought for these aggregates would not increase railroad revenue. The Ex Parte 162 decision granted an increase of 15¢ per ton.

If O.P.A. had not come to an abrupt end, Mr. Ahearn said that he was convinced that sand and gravel would still be under price control, in spite of the industry's having an overwhelming case for decontrol, because O.P.A. obviously was interested in control for control's sake. The industry had been successful in securing decontrol of railroad ballast and traction sand, and individual price relief had been afforded in many cases and, in some instances, area pricing orders were issued-evidence that some progress had been made toward a better price level.

The 1945 National Sand and Gravel Association safety contest showed improved results in both frequency and severity. The 1945 injury-severity rate of 0.9 days lost per 1000 hours of work compares with a 17 year average of 4.7; the frequency rate of 31.8 per million man-hours of work was better than the 17 year average of 34.2. There were no accidents resulting in death or permanent disability in 1945, with a total time lost of 3474 days. Falls of persons, handling of objects and machinery were the most frequent causes of accidents. Only 68 plants participated in the competition said Mr. Ahearn, in urging that the members realize the importance of safety to sound operation of their individual businesses.

Chas. E. Brady, W. R. Bonsal Co., Lilesville, N. C., and E. A. Goodman, Jr., B. V. Hedrick Gravel and Sand Co., Lilesville, N. C.

The Association is planning to place comprehensve and adequate information at the disposal of every member facing a collective-bargaining agreement since, as Mr. Ahearn expressed it, there are far too many agreements made that actually show that companies have surrendered far too much. Work is to be extended in the development of some form of standard contract for the guidance of producers, so that they will be informed of the nature of area agreements in effect.

Commercial sand and gravel production totalled 152,138,298 tons valued at $110,422,372 in 1945, showing a price increase of one cent, to 73¢ per ton, as compared to 1944. The 1946 tonnage was estimated as ten per cent higher than that for 1945, with the emphasis on small business, including agriculture. Some one million dwellings are expected to be started in 1947, and home building will account for about 40 per cent of all new construction expenditures in 1947, he said.

Mr. Ahearn analyzed the overall new construction prediction by the assistant Federal Works Administrator, showing an estimated dollar volume of $13,300,000,000 for 1947. Mr. Follen's predictions and breakdowns were summarized in the March issue of ROCK PRODUCTS (see crushed stone convention reports).

During 1946, the Association completed its work under Mr. Robert Ash's direction, for the development of a standard hauling contract, necessity for which grew out of the owner-driver problem where contractors have been considered employes.

The Board of Directors, said Mr. Ahearn, has approved his recommendations that the Association renew its study of standard cost accounting principles and procedures for the industry, the objective being the education of all producers regarding all the elements of cost involved in production, sale and distribution. The manual published in 1937 is considered out-of-date. Zoning regulations were to be discussed later at the convention, said Mr. Ahearn, because laws introduced in some States requiring operators of coal strip mines

to rehabilitate worked-over land have emphasized possible future trends of concern to the sand and gravel industry.

Mr. Ahearn said that State Associations are an absolute necessity for their handling of matters concerned with State legislation. In conclusion, he expressed his appreciation to the officers, executive committee, Board of Directors and the membership for their continued cooperation.

Engineering Director's Report

DIRECTOR OF ENGINEERING STANTON WALKER commented briefly on the activities of his office. He reviewed the history of the engineering division, started in January, 1926, and described the scope and purpose of research projects accomplished and now underway at the University of Maryland. A very lengthy list of research projects has been undertaken.

The most important current problem, he said, is the durability of concrete, for there are far too many cases of premature disintegration. Promise of improvement is held out by the use of air entrainment, which has already proved of great value in reducing the adverse effects of freezing and thawing. Some of the substandard sands, he said, result in good concrete when air is entrained in the concrete. The problem of lack of fines in concrete sand, a pressing problem where fines are deficient, may not be so important, in Mr. Walker's opinion, when such sand is used with air entrainment in concrete.

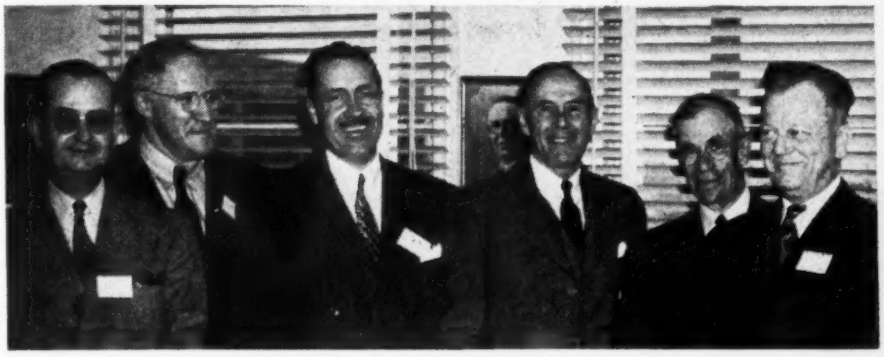
Mr. Walker reported that the short course of instruction for technicians had proven very popular, the result being that the course will be conducted again. The use of granular bases for highway construction, offering great possibility for expansion of volume, is receiving a great deal of recognition, according to Mr. Walker, who told of the use of 12-in. granular bases in an eastern State.

Railroad Car Supply

There is prospect of a continuing short supply of railroad cars for many months ahead, according to W. C. GRIFFIN, district manager, Association of American Railroads, who divulged the reasons for the car shortage in 1946 and made some predictions for 1947, before a meeting of the National Sand and Gravel Association.

The largest agricultural crop in history in 1946, the strikes, and problems connected with reconversion combined to make railroad cars short in the 18 months following V-J day, he said. The 41,300,000 carloads hauled in 1946 was far over prewar loadings.

New production heights are predicted for 1947, he said, with the result that the railroads will be extremely busy. The box car situation is most critical, with a large volume of the 1946 grain crop yet to be moved. Loadings the first seven weeks



Left to right: T. E. Popplewell, Fort Worth, Texas, vice-president of N.S. & G.A.; Ezra C. Knowlton, Salt Lake City, Utah; Bob Mitchell; Eric Ryberg, Salt Lake City, Utah; H. V. Owens, Utica, N. Y.; J. Rutedge Hill, Dallas, Texas

Left to right: Paul C. Graham, H. G. Feraud, John Gregg, and P. T. Akmadzich, all of Los Angeles

Harry D. Jumper and Glenn Moore of Consolidated Rock Products Co., Los Angeles, Calif., with E. K. Davison, J. K. Davison and Bros., Pittsburgh, Penn.

Ed. J. Nunan and H. N. Snyder, The Buffalo Slag Co., with E. M. Hammond, Gravel Products Corporation, to the right, all of Buffalo, N. Y.

Bob Mitchell, right, past president of N.S. & G.A., receiving diamond ring and scroll from V. P. Ahearn, representing 24 Southern California producers who signed the scroll and presented the ring in recognition of Bob's outstanding achievements for the benefit of the sand and gravel and ready mix industries

of 1947 ran 18 per cent over 1946 levels, up 4.3 per cent for coal and 55 per cent for other commodities. Sand and gravel loading is well over 1946 levels, he said, in predicting that the industry's demands for cars will reach a peak in 1947. Some 82,000 cars in all classifications are now on order, with a need for 100,000 new cars in 12 months. An average of 7000 per month is expected, resulting in a net improvement of 2250 cars per month. Mr. Griffin predicted that there will be a 20 per cent increase in movement of building material items in 1946 and an increase in 12 per cent in the movement of aggregates.

Tribute to Robert Mitchell

A joint luncheon of the National Sand and Gravel Association and the National Ready Mixed Concrete Association presided over by ROBERT MITCHELL featured a very excellent address on "American Problems" by WILLIAM M. JEFFERS, vice-chairman of the Board of Directors of the Union Pacific Railroad.

Mr. Jeffers, who served as rubber czar during the war, told of some of his interesting experiences in Washington during the war years and had an inspiring message on Americanism to convey.

America is a great country, he said, because it offers opportunity, which he contrasted with security. He urged all to sell America to the coming generation and suggested that it would be well worthwhile to spend some time with the youngsters with that objective in mind. They must be sold on free enterprise and its merits and contributions to Americanism.

Mr. Jeffers believes that legislation is necessary to prevent strikes that seriously affect the American public and that grievances should be submitted to arbitration. The closed-shop, in his opinion, is the most un-American condition existing in the country today, for it destroys initiative and puts a definite ceiling on the younger generation.

At this luncheon, Robert Mitchell was paid a rare tribute by 24 southern California producers, most of them competitors, with the presentation of a diamond ring and a signed scroll, which Mr. Ahearn was asked to present. Mr. Ahearn's inspiring presentation address and Bob Mitchell's response are published herewith in full.

Mr. Ahearn said:

"I have always heard that when a speaker made a talk he really made three talks. First was the one he prepared in advance, second was the one he actually delivered, and third was the one he made going home in the taxicab.

"I should like to confess to this audience that at least for once in my life I am terribly nervous as I face this microphone. Nervous, not because I fail to understand that I face a friendly audience, but nervous lest I fail to do an adequate job of telling Bob Mitchell what is in my heart.

"I sought recognition at this stage of our luncheon in order that I might carry out a most pleasant assignment. I have been given the privilege in behalf of 24 rock, sand and gravel and ready mixed concrete producers in the six southern California counties to present to Bob Mitchell tangible evidence of their deep affection for him personally, and their appreciation of all that he has done to contribute to the welfare of our two industries in Los Angeles and the state of California, and in the whole United States, as well as the respect and confidence, Bob, in which you are held in your own home town and understood and appreciated by every member of our two industries in the United States.

"You served with distinction as President of the National Sand and Gravel Association and you have been equally active in the National Ready Mixed Concrete Association, where you responded with characteristic enthusiasm to our call to come to Washington to perform a task of great concern to the industry.

"You are charged with the responsibility of the operation of a great company in our industry, but you have given an important amount of your time to the advancement of the interests of our industry in every section of this great country.

"To us you have symbolized progressive leadership and your career has been dedicated to the proposition that an industry must serve, not only its stockholders and its employees, but the public interest as well.

"It has meant so much to all of us that your capacity for leadership has been recognized in other walks of life and that you have accepted responsibilities which gave a larger scope to your talents, but we still claim you as our own. And at this, our family party, we take particular delight in telling you that you will always have a warm spot in our hearts.

"I know you will always treasure, Bob, the gift which comes to you from the 24 companies whose names I am going to read, all good friends and neighbors of yours, but symbolizing a friendship which knows no state borders.

"I know that you will be the first to say it is not the intrinsic value of this gift that is so important. It is the spirit which animates it.

"I would like to read to you the names of the companies who participate in presenting this gift to Bob, and I would also like to read to you the sentiment which illuminates this scroll.

" 'In recognition of the outstanding achievement in the interest of the rock, sand and gravel and ready mixed concrete industry, both nationally and locally accomplished by Robert Mitchell, for his untiring efforts in handling the problems of these industries, and the splendid leadership

Montague A. Craven, Certified Concrete Ltd., New Zealand; L. P. Price, Clarke-Halawa Rock Co., Honolulu, T. H.; Harry E. Bender, Azusa Rock and Sand Co., Azusa, Calif.

he has provided as president of the National Sand and Gravel Association during two wartime years, we express to him our sincere appreciation and thanks.' (Signed)—Arrow Rock Co., Azusa Rock & Sand Co., S. H. Bacon Materials Co., Blue Diamond Corp., Chandler's Palos Verdes Sand Co., City Rock Co., Graham Bros., Inc., John D. Gregg, E. Lockett & Son, Manning Bros. Rock & Sand Co., Owl Rock Products Co., Security Materials Co., Edw. Sidebotham & Son, Inc., Transit Mixed Concrete Co., San Diego Transit Mixed Concrete Co., Bakersfield Rock Co., Hartman Concrete Materials Co., Kern Rock Co., Mantalvo Rock Co., Santa Paula Rock Co., Saticoy Rock Co., Triangle Certified Concrete, Inc., Triangle Rock & Gravel Co., and Service Rock Co.

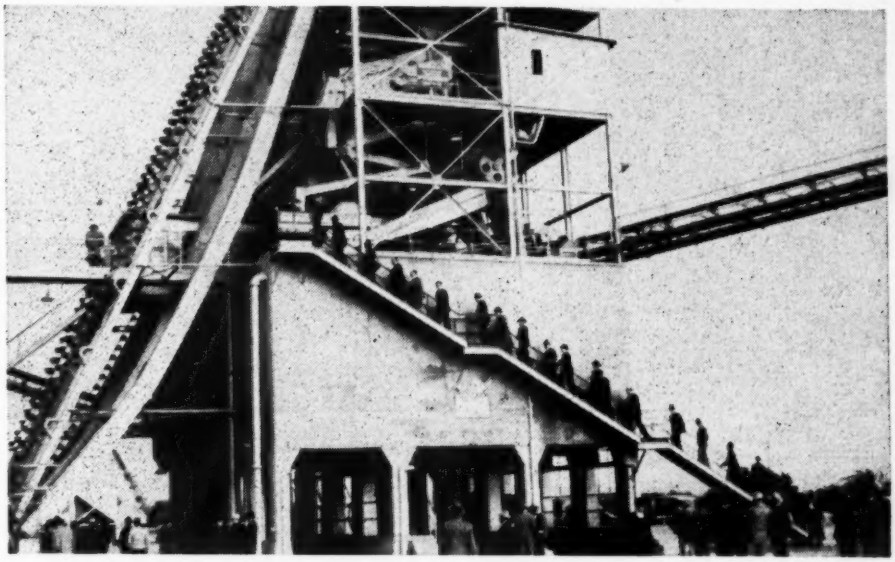
"It was one of the proudest moments of my life, Bob, when I was given the honor of presenting this beautiful ring to you, and I am sure that all will join with me in offering to you and your lovely wife the most cordial good wishes for good luck and good health."

Following the presentation, and enthusiastic applause, Mr. Mitchell rose to say:

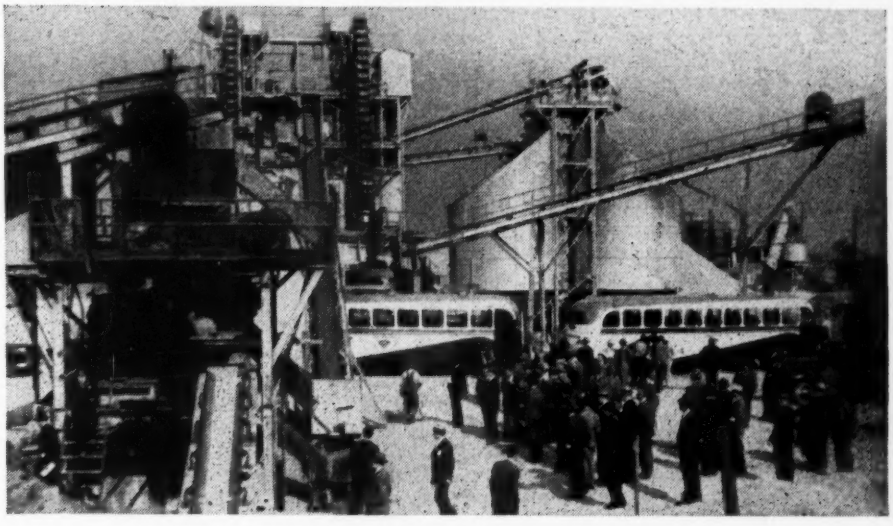
"This was not on the program and I really don't know what to say, but I will say that this is really and truly a very proud moment in my life.

"As I look before me I see my friends; I cherish that friendship. It means everything in the world to me and of course I do appreciate this tangible evidence—as Vince says, I didn't need it. If I have made any small contribution it has been a great and sincere pleasure.

"I don't know anything more to say, excepting to say with all my heart, thanks."



Inspection trip at the new plant of Azusa Rock & Sand Co., Azusa, Calif.



Convention visitors at the Graham Bros. plant, El Monte, Calif.

Inspection of Plants

An entire afternoon of the first convention day was set aside for the inspection of sand and gravel plants in the San Gabriel valley just outside Los Angeles. Buses were provided for transportation and a luncheon was served at the Graham Bros. plant—all through courtesy of the southern California producers.

Then followed a complete inspection of that plant, the Irwindale plant of Consolidated Rock Products Co. and the new plant of Azusa Rock and Sand Co. at Azusa. The latter operation and southern California practice, in general, were described in the February, 1946, issue of ROCK PRODUCTS, should any of the visitors desire to review or gather more detail from the trip.

Particular interest was expressed in the immensity of the operations (southern California producers shipped a million tons in January—The Editor), the great use of long conveyor belts, the large full-trailer (some retractable), diesel-powered trucks in service and the inexhaustible deposits of high-grade material in the banks. It was apparent that California practices and details of operation aroused more than ordinary interest.

The final afternoon was set aside for inspection of four ready-mixed concrete plants — the Blue Diamond Corp. plant, the Consolidated Rock Products Co. plant, S. H. Bacon Materials Co. plant, all in Los Angeles,

One of the luncheon groups on sand and gravel inspection trips, El Monte plant of Graham Bros.

and the plant of E. Lockett and Son in Pasadena. A luncheon was served at the Blue Diamond Corp. plant, preceding the inspection.

LEGISLATION

Affecting Labor-Management

APPEARING before a joint session of the National Sand and Gravel Association and the National Ready-Mixed Concrete Association, Charles A. Horsky, counsel for the two Associations, discussed existing laws and legislation pending in Congress affecting labor-management relations. Mr. Horsky's presentation was a straight-from-the-shoulder analysis, without benefit of notes, specifically pointed to emphasize that the two industries be aware of their responsibilities, stressing borderline cases and clarifying many points that are often overlooked or misunderstood. The significance of amendments to the Wage-Hour Act and the portal-to-portal pay problem comprised the bulk of his discussion for, as he said, there is a definite pattern of legislation already in Washington that can be talked about on those subjects.

While hundreds of bills have been introduced in Congress at this session dealing with some phase of labor-management relations, he said that the portal-to-portal problem has finally persuaded Congress to do something about the Wage-Hour Act.

Two bills have been pressed, one in the House and the other in the Senate. The House bill, passed by an overwhelming majority, which is the so-called Gwynne Bill, attacks the problem of portal-to-portal pay in a generalized fashion. It provides that the employer, when sued under the Fair Labor Standards Act or other Acts such as the Walsh-Healy Act, may depend on the faith he was acting on—the good faith in a public ruling or order. That would constitute a complete defense and would cover the Walling situation entirely, because a number of specific rulings from the Administrator and his office have been made on the scope of the Act as applied to the industry.

The Senate Bill differs in that it really is a straight portal-to-portal pay bill, by defining a scheduled work day and setting the beginning and the end of the work period. It constitutes an outright attack on the problem created by the Supreme Court decision in the Mt. Clemens case dealing with portal-to-portal pay and other decisions, and also there is a provision to put very stringent limits on the right of recovery by employees under portal-to-portal suits. It eliminates the double recovery feature for liquidated damages, it eliminates attorneys' fees and shifts the burden of proof to the employe.

Both bills, one of which is likely of adoption, have a new statute of limitation. The Senate bill provides for a two-year period and the House bill for one year. The bills are now pending in a conference which will settle which one is going to be adopted. Mr. Horsky would not predict which would prevail but was of the opinion that Congress probably should be swayed by the fact that the House vote was overwhelming, for the more drastic bill.

Whichever type of bill is adopted, he stressed that it still will be very important for the industry to be aware of the problems that are left, in terms of work time and travel time, under the Fair Labor Standards Act. If the Senate bill is passed, the problem of what constitutes work time and non-work time remains as important as it ever was. Rest periods constitute work time, and time for changing clothes because of the nature of a job is considered work time. Meetings scheduled for the benefit of the employer would be considered work time; grievance meetings while voluntary training sessions held after hours for the benefit of employees likely would not be considered as work time. Breakdowns, or time spent in standing around while work is being made ready, or schedule slip-ups would be considered as work time.

In Mr. Horsky's opinion, there will be a statute of limitations provided in either bill, for two years or for one year, which will protect the industry from problems created by the Walling ruling reversal of a year as to whether the industry was covered or not (Walling said yes, the Circuit Court of Appeals reversed his ruling) when

(Continued on page 147)

C. Eugene Ireland, Birmingham Slag Co., Birmingham, Ala., visiting with one of the men on field trip

Ladies Entertainment

By Mrs. BROR NORDBERG

TO THE MEMBERS of the Southern California Rock Products Association and the Southern California Ready Mixed Concrete Association, the ladies of the convention are greatly indebted, for a full program of entertainment the week of March 3. To the chairman and vice-chairman for ladies' entertainment, Mrs. W. J. Van Valkenburgh, and Mrs. Harry E. Bender, and their committee a very special expression of gratitude is in order. Over 150 ladies participated in the entertainment planned for them, and, by such a great turnout, more than for any convention in the history of the Associations, a real appreciation was shown for the magnificent hospitality of the Southern California Associations.

The Events of the Week

The Get Acquainted Luncheon in the beautiful Marine Room of the Jonathan Club set the tempo for a gala week with 116 ladies present, and all looking especially lovely in fashionable Spring hats. Cordial greetings were expressed by the very gracious Mrs. Harry Bender, vice-chairman of the ladies' entertainment program, and a spontaneous reply voicing the appreciation of the guests was given by Mrs. C. Eugene Ireland of Birmingham, Ala.

The following day, Wednesday, March 5, the ladies of the convention, in three buses, took a sight-seeing trip through Beverly Hills, Westwood, and Santa Monica, and a delicious luncheon was served in the Terrace Room of the Beverly Hills Hotel. The Farmer's Market in Hollywood was visited in the afternoon, that marvelous place where little booths cover acres of ground and one may buy anything from a black-masked Mexican love bird or a hooked rug to a choice from the extravagant assortment of food products of bountiful California.

Thursday brought more sight-seeing through Pasadena, the Huntington Library, Art Gallery and Gardens, and the 176 year-old San Gabriel Mission. The Huntington gardens were particularly lovely in the bright, warm California sunshine, so welcome, especially to the eastern delegates who had come from colder climates.

Thursday evening the ladies and the gentlemen enjoyed a trip through Olvera Street, and Chinatown with their many exotic and fascinating curio shops. The Griffith Park Planetarium was also visited, and from the hill where the planetarium stands, the lights of Los Angeles shone as the stars in a huge constellation.

The radio show, "Queen for a Day," held in Earl Carroll's theatre, was on the program Friday morning. The ladies sat at tables in the terraced auditorium and had a late breakfast

(Continued on page 104)

Some snapshots of ladies attending convention entertainment functions. (1) Mrs. Maybell Stepanian, Columbus, Ohio; (2) Mrs. Harry Bender, San Dimas, Calif., chairman of the Committee on Convention Arrangements for Ladies Entertainment; (3) Mrs. Robt. Mitchell, wife of Bob Mitchell who was Chairman of Committee on Convention Arrangements; (4) Mrs. Ralph Johnson, Durand, Mich.; (5) Mrs. Bradley S. Carr, Chicago; (6) Mrs. Herbert Jahncke, New Orleans, La., Mrs. F. E. Schouweiler, Fort Wayne, Ind., and Mrs. Chas. H. Grant, Oakland, Calif.; (7) Mrs. Eugene Boynton, Jr., and Mrs. Eugene Boynton, both of Muscatine, Iowa; (8) Nancy Graham, Mrs. Russell Graham, Mrs. Addison Jones, and Mrs. Paul Graham; (9) Mrs. J. R. Northington and Mrs. Fritz Schmidt, Davenport, Iowa; (10) Mrs. Walter L. Smith, Memphis, Tenn., and Mrs. A. N. Jefferies, Fort Worth, Texas; (11) Mrs. John A. Sauerman, Chicago, Mrs. J. S. Cooper, Memphis, Tenn., and Mrs. Harry Bender; (12) Mrs. M. A. Craven, New Zealand, Mrs. Helen R. Jumper of Azusa, Calif., and Mrs. Maybell Moore, Arcadia, Calif.; (13) Mr. A. M. Logan of Seattle, Wash., sees Mrs. Logan off on tour; (14) Mrs. Roy E. Weaver, Lincoln, Ill., and Mrs. Wm. Wyckoff, Indianapolis, Ind.; (15) Mr. and Mrs. M. Eugene Sundt, Albuquerque, N. Mex.

before the show. The attractive Mrs. Walter L. Smith of Memphis, Tenn., one of the convention party, was chosen as one of the five members of the Council which had the responsibility for choosing the "queen" from the five candidates picked from the audience by the master of ceremonies.

Some of the ladies had lunch at Carroll's and stayed for another broadcast, and some went shopping in the fabulous L. A. shops, while the others rested from a week filled with activities to get ready for the week-end trip to Palm Springs and Riverside.

The gentlemen of the convention joined the ladies for a perfectly wonderful week-end to the desert. Over 100 made up the party.

The eastern members were especially enthusiastic about this trip. Many miles of the drive to Palm Springs were through fruit-laden orange groves, through acres of guayule shrubs, the new experimental source of rubber, and through vineyards, walnut groves and olive groves.

The bright, hot sun was very welcome at Palm Springs and friendly groups formed for a delightful luncheon at the umbrella-shaded tables on the outside terrace of the Desert Inn. After a pleasant afternoon spent either visiting a nearby date grove or just enjoying the grounds of the Desert Inn, the party was taken in buses to one of the most unique hotels in America—The Mission Inn of Riverside, California. As the party entered the 70-year-old inn, they were introduced to a romantic old Spanish atmosphere. The inn is a treasure house of history and art; it is a glorified museum.

Sunday afternoon the party returned to Los Angeles over the old Sante Fe trail, concluding a glorious convention week.

DURABILITY OF CONCRETE

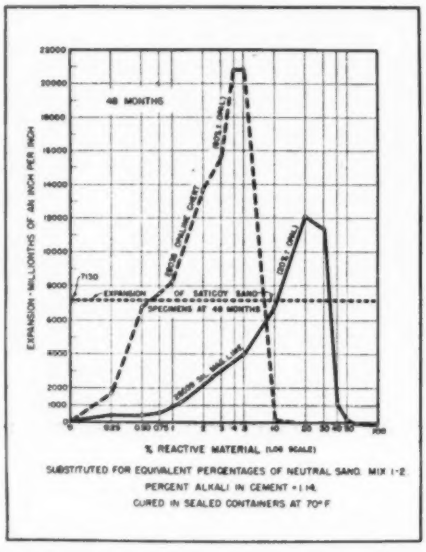
THOMAS E. STANTON, Materials and Research Engineer, California State Highway Department, presented a paper, "Durability of Concrete as Affected by Aggregates" before a joint technical session of the National Sand and Gravel Association and the National Ready-Mixed Concrete Association.

Mr. Stanton's paper was concerned with unsound concrete as observed in California, resulting particularly from adverse reactions between the alkali constituents of portland cement and certain minerals in the aggregates. The general subject is one that has been widely publicized in recent years, but one of intense interest to concrete engineers.

The alkali constituents of the cement occur in the form of sodium and potassium oxide which, when present in a combined quantity to exceed 0.60 per cent, react with certain types of silica in the aggregate to produce excessive quantities of a silica gel or sodium potassium silicate, according to Mr. Stanton's research. An enormous pressure sufficient to rupture concrete is exerted by formation of the gel. Opal in the opaline cherts and the glass matrix of some volcanic rocks are the identified troublesome minerals in California.

The extent of the rupture is roughly proportional to the percentage of alkalis in the cement and the reactive ingredients in the aggregates. One of the phenomena of the action, said Mr. Stanton, is that if the percentage of reactive aggregate particles exceeds a certain amount, the measurable effects of the reaction decrease until it may finally become entirely non-existent. An attempted explanation is that this is a result of such a complete distribution of the reactive aggregate particles throughout the mass that the reaction products in any unit are insufficient in volume and pressure to cause failure.

Mr. Stanton briefly reviewed some of the original studies to discover the cause of extensive concrete failures along the coast between the Palos Verdes area in Los Angeles county in the south and Monterey county in the north. Particles of shale and/or chert observed in numerous popouts led to the deduction, at that time, that the action was entirely physical and the solution, partly influenced by alternate wetting and drying tests, appeared to be to limit the percentage of such particles. Shale aggregate concrete bars developed excessive volume changes that indicated that some excessive expansion due to physical causes may be anticipated over a period of years. It is known that shale


48 MONTHS
EXPANSION - MILLIONTHS OF AN INCH PER INCH
7/30
EXPANSION OF SATICOY SAND IN SPECIMENS AT 48 MONTHS
% REACTIVE MATERIAL (LOG SCALE)
SUBSTITUTED FOR EQUIVALENT PERCENTAGES OF NEUTRAL SAND. MIX 1:2
PERCENT ALKALI IN CEMENT = 1.14.
CURED IN SEALED CONTAINERS AT 70° F

Showing relation of expansion in concrete according to reactive material in aggregate

inclusions near the surface of the concrete may cause popouts but it is not known that the expansion would be sufficient ultimately to rupture the concrete when the percentage of shale particles is of low order. The sulphate soundness test was included in the specifications as a means to hold the shale to a practicable minimum. Subsequent to these volume change tests, the principal cause of extensive concrete disintegration in the coastal area was traced to the opal constituent of the cherts. These cherts have from less than 20 per cent to more than 80 per cent opal, ranging from the 20 per cent (more or less) opaline chert, designated as siliceous magnesian limestone, to the true opaline cherts which contain as high as 80 per cent or more opal. According to Mr. Stanton, it has been conclusively proven that substantially less than one per cent of this high opal content rock in the fine aggregate is sufficient to cause serious trouble.

Mr. Stanton then described some of the concrete failures studied, which led up to the discovery of causes of premature failure and the solution that resulted. He also described test procedure developed to arrive at a solution. In many cases local sources of fine aggregate, as contrasted to commercial sources, were at fault, but a complicating factor was that such aggregates performed satisfactorily in some instances.

Although sulfates in sea water contributed to ultimate serious disintegration of sea walls, it was obvious that the failure was accelerated by the infiltration of sea water through cracks resulting from other causes.

Some of the faulty "local" sands when used with different cements resulted in satisfactory concrete, which gave rise to the suspicion (later confirmed) that a chemical reaction between certain ingredients and some ingredient in the cement was responsible for the expansion. Tests showed that when a cement low in alkali (0.45 per cent sodium and potassium oxides) was used with a local sand that, when used with a 1.14 per cent alkali cement resulted in extensive disintegration, little if any expansion resulted. Subsequent tests have proved the expansion to be roughly proportional to the alkali content of the cement whenever used in combination with aggregates containing minerals readily soluble in sodium hydroxide. And, sands with negligible percentages of opaline shale and chert or highly soluble volcanic glasses have developed little, if any, expansion even with high alkali cements.

Mr. Stanton discussed in some detail the aggregates included in the study, including California cherts and aggregates high in granite, sandstone and quartz-feldspar and, he said, field observations have confirmed laboratory test results. The volcanic glass

(Continued on page 148)

Some candid camera "shots" of Palm Springs-Riverside trip: (16) Mrs. Robt. F. Porter, Towson, Md., and Mr. and Mrs. Wayne W. King, Baltimore, Md.; (17) Mrs. Grace Sharp, Vince Ahearn's busy secretary; (18) Vera Shirey, daughter of C. W. Shirey, Waterloo, Iowa, and Mrs. Jos. M. Scheinin, New York City; (19) Mr. and Mrs. Chas. P. Maloney, Washington, D. C.; (20) Mr. and Mrs. Wm. H. Wyckoff, Indianapolis, Ind.; (21) Mr. and Mrs. Wm. Edward Hole, Greenville, Ohio; (22) Mr. and Mrs. Abe Goldberg, Milwaukee, Wis.; (23) Mr. and Mrs. H. N. Snyder, Buffalo, N. Y.; (24) Mr. and Mrs. Stephen Stepanian, Columbus, Ohio; (25) Mr. and Mrs. C. C. Deal, Elkhart, Ind.; (26) Mr. and Mrs. H. P. Caldwell, Louisville, Ky.; (27) F. K. Wills, and Irving Warner, Philadelphia, Penn.; (28) Theo. F. Knight, Centerline, Mich., Nelson J. McBride, Detroit, Mich., and Geo. B. Southworth, Cleveland, Ohio; (29) Mr. and Mrs. R. E. Weaver, Lincoln, Ill.; (30) The C. W. Shirey family, Mrs. Shirey, Craig, Vera, and Mr. Shirey

Agricultural Limestone

Looking Into the Agstone Crystal Ball

Replies to questionnaire sent to agricultural limestone producers indicate continueing need for government support, but sales promotion urgently needed for future

By BROR NORDBERG

PRESIDENT Truman's recent recommendation to Congress that soil conservation payments be reduced from the $300,000,000 annual figure that has prevailed for four years, to $200,000,000 for the 1948 crop year, has prompted the editors to attempt an appraisal of the probable effect such action would have on producers of agricultural liming materials. The important question is whether the farmer, speaking for the nation as a whole, has been sufficiently educated to the absolute necessity for soil liming (on most of our important cropland) so that producers of liming materials can hold their high levels of sales and, we add, increase the tonnage spread on our farms to needed levels.

If drastic curtailment of these funds, often referred to as subsidies, will bring about material reduction in the national tonnage, we will fall farther behind in the tonnage goals set for us by the nation's outstanding agricultural authorities, estimated as necessary for the maintenance of soil fertility. These authorities have time and again stated that 52 million tons of agricultural liming materials must be spread on the farms each year in order to hold our own; merely to replace the annual losses caused by cropping, leaching and erosion. Approximately half that annual goal, 25,000,000 tons spread, was achieved in 1946 to break all records, still leaving us 27,000,000 tons short of an adequate maintenance job.

With the continued existence of the soil conservation program at stake, even to the possible eventual withdrawal of funds entirely, the realization is at hand that higher considerations than the economic effect on any single industry are involved. For, our soils are our number one capital asset and agronomists say some 500 million acres have been destroyed by erosion already, with another 50 million far gone. Therefore, as we see it (and most of us hate subsidies), it does not appear so important whether government spending for continuance of an agency originally created to educate farmers in soil conservation practices is to be maintained or not; the all-important consideration is the conser-

Four samples of typical newspaper advertising promotion

Riverton Lime and Stone Co., Riverton, Va., distributes a very attractive folder printed in green and black

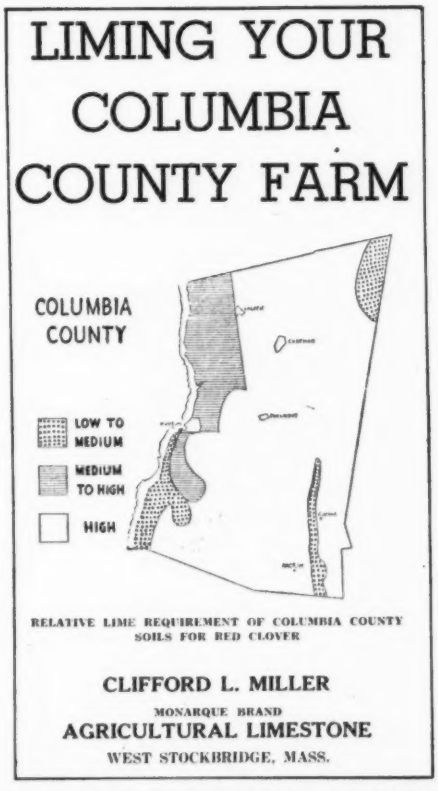
vation of our soil fertility by whatever means are necessary to insure it. If the farmer will continue to spread liming materials, and expand the application to his soil, at increasingly greater cost to him, reduction in federal aid would be highly desirable and recommended; otherwise the alternative is to continue financial aid at levels necessary to guarantee preservation of the nation's soils.

We sought an answer to this all-important question, as measured by the effect of curtailment of government financial aid to farmers on the probable trend in volume of business in the agricultural limestone industry, in a letter addressed to the industry seeking a "poll" of opinion.

The response was gratifying and, we believe, informative.

Replies were received from companies producing nearly 10,000,000 tons of agricultural limestone annually, ranging in size from new, small concerns with modest output (and some with no sales setup) to some of the extremely large tonnage producers that have been in business for years. We asked for opinions concerned with a given company's own volume of business and for predictions as to probable industry-wide effects that might result from changes in government financing for liming materials.

The overwhelming majority of companies that replied were in favor of continuance of government aid, and supported their predictions of a resulting curtailment in volume of sales with logical and expected reasons which will be discussed herein. A relatively few advocated discontinuance of government financial aid entirely, being opposed to the payment of subsidies to any "favored group," but, in those very cases, and almost without exception, each concern predicted that a substantial loss in volume of sales for the industry would follow a curtailment of federal financing. The questions, and analysis of the replies follow.



Cover of two-page folder distributed by Clifford L. Miller shows the soil requirements in the county served

"If A.A.A. (its successor is Field Service Branch, Production and Marketing Division, U.S.D.A.) should not buy any agricultural liming materials, either through purchase orders or by contracts, and all sales would be on a cash basis but supported by A.A.A. payments on application, what would be the probable effect on the industry as a whole and on your business?"

Replying to this question, 22 per cent (in numbers) said there would be no drop in their own volume of business, while 12.5 per cent predicted no reduction in volume for the industry as a whole. However, the average (all returns) was a 24 per cent decrease in volume of business for the industry based on each company's expectation of its own volume.

Basing their predictions on estimated effect industry-wide, there will be a 30 per cent reduction in volume of sales, where the farmer must pay cash and wait until the end of the crop year for payment. The figures were 31 per cent, excluding those who predicted no reduction, where companies made predictions based upon their own individual cases, and 34.3 per cent based upon each one's prediction for the industry (also excluding those who predicted no re-

duction). Examining the statistics further, 4.4 per cent (in numbers) estimated that there would be a reduction in volume of sales exceeding 75 per cent, 21 per cent predicted a loss between 50 and 75 per cent, and 24 per cent a drop between 25 and 50 per cent in volume.

These data, and others that follow later in reply to our second question, relative to the probable effect should federal payments be dropped entirely, cannot be taken entirely literally. If supply exactly balanced demand, the predicted drop in volume of business likely would even be higher, for a great number of companies have not been able to supply all orders and, it is evident, that the returns were based upon probable volume based on *all* potential sources of sales including the would be purchasers who could not be served.

Localities were a factor in company predictions that higher or lower reductions in volume would follow, for the industry, than in their own particular businesses. For example, in territories of virgin soil, liming may may not be an imperative need and it has been found necessary that government payments be made on the spot, so to speak, to stimulate what may be considered an experimental demand and a market yet to be exploited. The cost, in those cases, would be too great for the producer to develop the market.

The real progressive farmer would be the only one who would buy liming materials for cash and await later reimbursement in proportion to credit earned, according to a number of reporting companies, and the farmer would then assert himself to demand delivery without regard for the producer's schedules and production problems.

It was also pointed out that the success of the deferred payment plan would depend, in some instances, upon how soon the farmer would be reimbursed, and that many farmers would go without liming materials rather than be burdened with the necessity for filling out forms, preferring to slide by a few years without liming. Importantly, there are large areas where liming has yet to be introduced where financial aid not only is required but must be available quickly in order to stimulate the farmer's interest and because the farmer is unable to pay cash. These areas are in greatest need of development.

What if No Federal Aid?

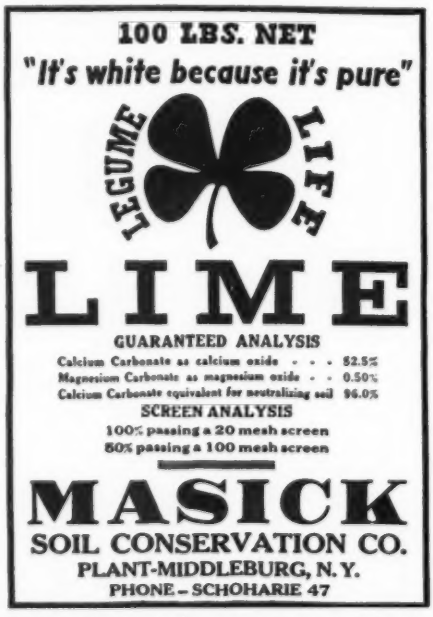
Anticipated reductions were much more serious, in reply to a question as to the effect on the industry and on individual businesses if no federal payments for liming materials were to be made. A very small percentage, 3.5, did not anticipate that there would be any reduction in sales for the industry but those returns could almost be discarded because they apply in exceptional, out-of-the ordinary territories. For example, the blue grass farmers in the vicinity of Lexington, Ky., recognize the value of liming their land and are well able to, and do, pay cash. The average predicted decline in volume was 51 per cent for the industry, or 53.4 per cent when including only those (96 per cent) who anticipate a decline in volume. Analyzing the data further, 18 per cent of the companies represented, expect a decline in volume for the industry, exceeding 75 per cent, and 58 per cent anticipate a reduction between 50 and 75 per cent. The effect of such reductions, when applied to the overall national tonnage, would amount to 13,000,000 tons annually at a time when the need is to increase the existing 25,000,000 tons spread to a minimum of 52,000,000 tons.

No significance could be attached, territorially, to the predicted reduction in volume although it goes without saying that marginal territory would suffer the greatest and, in some areas where liming is badly needed, there would be little likelihood of introducing soil conservation practices. The very large concerns, those with well established sales organizations and which cooperate with dealers, were, curiously, largely in the group anticipating a reduction in volume of sales of from 50 per cent to 60 per cent. Those same companies would anticipate a reduction in volume if government payments are available, only for deferred payment, as reported in reply to our first question. The dealer organizations, working closely with the farmers, are a factor in preserving that kind of business.

Much depends upon the prosperity of the farmer. In those territories where liming has gained a foothold and has been in use long enough for the farmers to really observe the benefits from liming their own soil, the really progressive farmer (he's much in the minority) might continue to apply agstone even if he has to pay the entire bill, provided he continues to make good profits. The inclination, however, would be to apply liming materials more sparingly and, when profits and farm income drop, to eliminate liming. The practice is still so new in so many territories and to so many farmers that benefits from liming have not yet become evident, for the solution of carbonates into the soils and its availability to plants requires, under average conditions, a minimum of two or more years. And, in far too many cases, the timing of delivery, the amount of application, the place of application and the uniformity of size of product (segregation in transit) have not contributed to optimum efficiency. These shortcomings stand to be corrected.

In general, southern farmers are not so well off financially as their northern brethren and, as pointed out by large producers who otherwise frown on subsidies, absolutely require financial aid. There are hundreds of thousands of acres involved. One important point, stressed by many, is that tenant farmers, who work some 50 per cent of the total acreage, are not sufficiently interested in the soil they occupy to pay out-of-pocket cash for liming materials. They are interested in immediate return only and constitute, at best, poor sales prospects without the help of outside financial aid. It appears apparent that large companies which have been shipping by rail stand to lose considerable volume far afield, which they have been furnishing because local suppliers were unable, in the event the farmer must pay total per ton cost plus freight.

Many of the smaller producers, and there are many who are comparatively new to the industry, claim that they could not afford advertising and sales promotion costs at the prices that prevail. They cannot all be criticized for their failure to undertake the kind of merchandising that should have been supporting government educational effort all along because, for the sake of gaining production, some were encouraged by the government to make considerable capital investment and then were plunged into all-out production schedules in an attempt to fill tremendous demands. Those companies, and some individuals, have done an excellent job but certainly have had little, or no, opportunity to develop sales organizations for future market building. And, some of the well-established companies were induced by the government to extend their operations at great expense and now are rightfully concerned as to the prospect of probable loss of markets.


100 LBS. NET
"It's white because it's pure"
LEGUME LIFE
LIME
GUARANTEED ANALYSIS
Calcium Carbonate as calcium oxide - - - 52.5%
Magnesium Carbonate as magnesium oxide - - 0.50%
Calcium Carbonate equivalent for neutralizing soil 96.0%
SCREEN ANALYSIS
100% passing a 20 mesh screen
80% passing a 100 mesh screen
MASICK
SOIL CONSERVATION CO.
PLANT-MIDDLEBURG, N.Y.
PHONE – SCHOHARIE 47

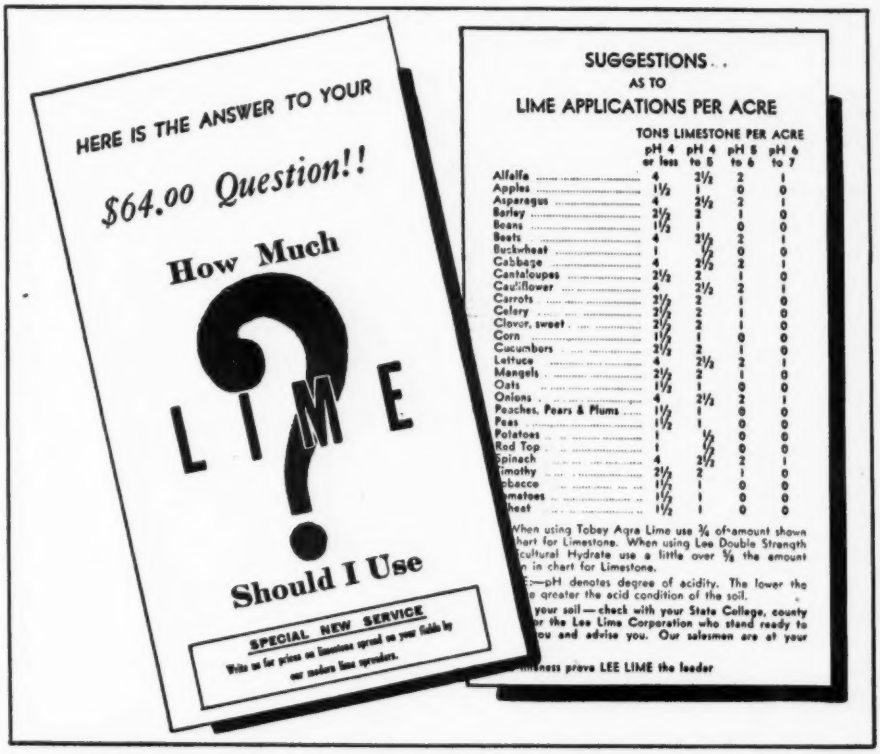
Sample of advertising on paper bag put up by Masick Soil Conservation Co. Note trade name "Legume Life"

Some of the more informative comments submitted are quoted here, in part, along with the percentage reduction (in parentheses) they anticipate in volume should government aid be withdrawn altogether.

From Iowa (50 per cent): "No liming materials were in use in the territory we serve until the A.A.A. promoted it through the contract method. Northwestern Iowa is still relatively virgin soil, and while liming is decidedly beneficial it is not an imperative 'must' in order to grow legumes—or anything else—as it is in many other sections of the country. While the practice is gaining acceptance, it is still in the nursing stage and must have A.A.A. assistance at the county and township level to encourage its use in order to get the 95 per cent of the farmers who have not tried it to do so. For private enterprise to endeavor to stimulate this experimental demand would add considerably to the cost — 'sales promotion.' From eastern Iowa eastward, liming is, so to speak, an accepted practice. From central Iowa westward, it is not. It is yet an experiment, untried by 95 per cent or more of our farmers."

From Massachusetts where competition is apparently keen and where, as of several months back, evidence of a buyers' market had appeared (75 per cent): "Only the really progressive farmer would buy liming materials and pay cash for it. He would want his lime delivered at the particular time he needed it. That would mean about ten weeks of good business in the Spring and another eight weeks in the Fall when business would be fair. The rest of the year, plants would be idle. Cost of production would be much higher while competition would be keener. Only the progressive farmer would buy and he only seasonably. When farm prices go down as they probably will, even the progressive farmer would do without agricultural limestone after an unprofitable year."

A large Pennsylvania producer of fine-ground agricultural limestone (75 per cent): "The prosperity and growth of our country is in direct proportion to the fertility of the soil. Therefore, it would seem then that soil conservation is the number one national economic issue. The government should assume full responsibility for adequate soil conservation either directly or indirectly. Due to the fact that soil depletion is a slow, but sure process, if it is not conserved, and may not be a national disaster today but could be 10, 20, or 30 years from now, it is very easy to see that the farmers might, if left only to their own devices and methods, remove from the soil large amounts of minerals, nitrogen, phosphorous, and potash, knowing perhaps that these should be replaced in their generation but assuming the next fellow will do it. This then might be too late.


HERE IS THE ANSWER TO YOUR
$64.00 Question!!
How Much
LIME
Should I Use
SPECIAL NEW SERVICE
SUGGESTIONS . .
AS TO
LIME APPLICATIONS PER ACRE
TONS LIMESTONE PER ACRE
pH 4 or less
pH 4 to 5
pH 5 to 6
pH 6 to 7
Alfalfa 4 2½ 2 1
Apples 1½ 1 0 0
Asparagus 4 2½ 2 1
Barley 2½ 2 1 0
Beans 1½ 1 0 0
Beets 4 2½ 2 1
Buckwheat 1 ½ 0 0
Cabbage 4 2½ 2 1
Cantaloupes 2½ 2 1 0
Cauliflower 4 2½ 2 1
Carrots 2½ 2 1 0
Celery 2½ 2 1 0
Clover, sweet 2½ 2 1 0
Corn 1½ 1 0 0
Cucumbers 2½ 2 1 0
Lettuce 4 2½ 2 1
Mangels 2½ 2 1 0
Oats 1½ 1 0 0
Onions 4 2½ 2 1
Peaches, Pears & Plums 1½ 1 0 0
Peas 1½ 1 0 0
Potatoes 1 ½ 0 0
Red Top 1 ½ 0 0
Spinach 4 2½ 2 1
Timothy 2½ 2 1 0
Tobacco 1½ 1 0 0
Tomatoes 1½ 1 0 0
Wheat 1½ 1 0 0
When using Tobey Agra Lime use ¾ of amount shown chart for Limestone. When using Lee Double Strength cultural Hydrate use a little over ⅝ the amount in chart for Limestone.
—pH denotes degree of acidity. The lower the greater the acid condition of the soil.
your soil — check with your State College, county or the Lee Lime Corporation who stand ready to you and advise you. Our salesmen are at your
ness prove LEE LIME the leader

Two-page folder distributed by Lee Lime Corporation promoting the use of both agricultural limestone and lime. Information is of practicable value to farmers

"We feel that soil conservation as stated above is the government's responsibility either directly or indirectly because the government is the people and the life of each person is absolutely dependent on the efficient working of 2½ acres of our land by farmers, over which the individual has no control except through his government. Even today soil conservation practices are only being carried out on about a 50 per cent basis.

"We as individual producers and as individual citizens, of course, cannot say to what extent the government should support soil conservation, but have to be guided by the facts as developed by our agronomists and if the government's assistance for the past ten years has only provided for approximately 50 per cent of their recommendations, then obviously there should be no support withdrawn from the farmers, but it should be increased."

A small producer in Michigan (25 per cent): "Most farmers now realize that they must use liming materials in order to produce good yields. The poor farmers would discontinue the practice."

From New York State (50 per cent): "The industry could not afford the selling costs of the present large volume at their present low prices for liming materials. Under the system of cut-throat bidding which the liming materials companies follow at the present time they are entirely at the mercy of A.A.A. for their business, unless they get wise to themselves and allow for advertising and salesmen in the field when setting prices in the future.

"The contract system of the A.A.A. is a curse to the industry. It encourages large crushed stone operators to bid a low price on farmyard delivery figuring on large volume and mass delivery as they are accustomed to on crushed stone and black top contracts. They find out only too late that mass delivery and large volume to farmers is impossible. They usually learn at the end of one year but the rest of us suffer by their ignorant bidding."

From the West Coast (30 per cent): "Agricultural lime business would drop off considerably — the A.A.A. program has done much to educate the farm industry to the values of the use of liming materials, but because of the farmer's hesitancy to put out cash for any fertilizer or soil conditioning material for long range benefits, the demand would drop off."

From Virginia (50 per cent): "Members of this industry know from years of experience in marketing their products that without stimulus many farmers will not lime their soils or, if they do, the amount they use is too small. This is true not only of a high percentage of farm owners but of practically all farm tenants."

From Oklahoma (50 per cent): "There is no doubt in my mind that a curtailment or a complete stoppage of the payments for fertilizer and agricultural limestone, would in a large degree, reduce the volume of agricultural limestone sold. The farmers are not ready for too much curtailment or a complete stoppage of

federal aid, especially in Oklahoma, which is a part of the Southern Region. Farmers just don't have the money to improve the soil as it needs to be for high production and high food value.

"Farmers in the Southern Region are not financially able to buy fertilizer in sufficient quantities to make a profit even though their yield is larger by using it. The effect on the general public is important because they must have nourishing food and plenty of it. We think farmers will always need help by government.

An Illinois producer, one of several who expressed himself as opposed to subsidies (20 per cent): "The triple "A's," acting as an agency duplicates the work of nearly every manufacturer and as such it is a wasteful expenditure. Encouragement in soil conservation is very valuable. During prosperous years farmers will use liming materials whether they get government dole or not. In principle it is wrong and I am opposed to it."

From Ohio, a large tonnage producer who merchandises through dealers (60 per cent): "Extent of the decline depends greatly on the availability of five-year bank loans, etc. A strong dealer organization would serve to offset loss of government funds. Decline in present high farm income levels would also operate adversely."

From Kentucky (60 per cent): "Before Congress reduces the appropriations for Soil Conservation Payments, it should be reminded of the importance this program has, not only to land owners, but to everyone. Furthermore Congress should be asked if it realizes the seriousness of this proposition from the producers' standpoint.

"During the war emergency years, the government requested and encouraged producers to produce more agricultural limestone. This request was so important and real, that it caused the greater part of the producers to expand their production to the extent that they had to make large capital investments, and extensive improvements to their plants in order to meet this request of our government.

"Now, Congress is desirous to reduce the benefits to the farmers for limestone, with full knowledge of the effect it will have on the producer, as it is our honest opinion if this benefit is curtailed the demand for agricultural limestone will be reduced 60 per cent."

From Illinois (? per cent decline): "There would be a noticeable decline in volume of sales. Just what per cent, I can't say. It is my opinion that very few tenant farmers would buy any limestone, as two or more years are required to show any noticeable results in crops from liming, while most tenants are on the move oftener than that."

From Iowa (50 per cent): "If the triple A should stop and no payments be made, I am certain it will cripple the agricultural limestone industry quite a bit. I can truthfully say that if my production should be cut 50 per cent I could not possibly afford to keep a full crew of men on a steady payroll. With present day equipment you cannot run a good plant unless you have a full crew; it certainly does not pay to run your machinery idle part time because of lack of help. Help is at an all-time high and hard to get. Workers want steady work or they will quit. Fertilizer is more available now and there are many who think that they get more for their money that way than to buy limestone. It will take a number of years before they will find out that they must continue the use of lime."

From Missouri, one of the dissenters on the subject of government payments to farmers: "Regarding your inquiry as to whether or not A.A.A. should buy agricultural liming material I feel very strongly that it should not. Everyone is clamoring for reduction in taxes, yet I received a number of letters requesting me to urge my congressman not to reduce appropriations for soil conservation purposes, etc. Would we not all be better off by a large reduction in government expenditures even though we did without some of these services?

"The A.A.A. must maintain several thousand offices around the country with people in these offices taking orders over the telephone for lime which in turn are transmitted to the producer—a million or more vouchers are made out to pay for it, etc. Why should a limestone producer have to have the government act as his sales agent? I spent large sums of money 25 years ago to promote the sale of agricultural limestone. I don't need the government to sell my wares.

"If the governments insists on giving the farmer a certain quantity of agricultural limestone then at least let the farmer do his own procuring. He is an adult, able-bodied gentleman."

From Tennessee (50 per cent): "Our shipping area is in the South and Southeast where A.A.A. support to the farmer for agricultural materials is absolutely necessary. Many of the farmers cannot maintain the fertility of their land or improve their farms unless financial aid is given them by some agency."

A large Ohio producer (60 per cent): "Without A.A.A. payments, we feel that our volume would be reduced, as many farmers are not thoroughly sold on the value of liming. In our opinion, the industry as a whole would suffer more than we would as many producers were not in the agricultural limestone business until the advent of A.A.A. We are located in an excellent agricultural area but some producers are marketing their products in more backward territories. In our opinion, these poor regions would use very little lime without A.A.A. help."

From Massachusetts (80 per cent): 'The individual farmer who has limed his soil under the A.A.A. program will feel, regardless of need, that he can get by without putting up money for lime for a few years, and is apt either to coast on the backlog he has built up or divert a substantial amount into fertilizer. This will be particularly true in the event of a reduction of income to the farmer due to low farm prices. The result must inevitably be that the marginal and near marginal farms (those who need it most) will be the first to discontinue. This same effect will be evidenced in every farm purchase."

From New York State (80 per cent): "The volume of our business would decrease to the extent of approximately 80 per cent; the volume for the industry would decrease approximately 80 per cent because a large percentage of farmers feel they have used considerable amounts of tonnage of agricultural lime in the past few years and would feel they could slide by for a time without purchasing any, particularly when they would have to pay all of the cost.

"I wish to state further that after the 20 years' experience I have had in the agricultural limestone industry, I believe it is necessary to keep the lime program up to the standard that it is at the present time and still more if possible for the benefit of the health of our civilization."

Deferred Payments

Some of the more informative comments as to the probable effects should the deferred payment plan be substituted for purchase orders and contracts are quoted here, in part:

From Massachusetts: "A.A.A. representatives are located in every community and actually go to the individual farmer to take his order for lime, which is transmitted to the producer through the State office. No individual producer or group of producers has the selling organization nor do the dealers have men qualified and trained to give proper technical information to the farmer to point out the great need of keeping up the mineral content of his soil. In addition, the cost of lime to the individual farmer would be greatly increased by the medium of dealer distribution which would result in a reduction of 15 to 20 per cent on the number of tons of lime per farm from the standpoint of cost alone. If producers or dealers have to do the selling job, the cost of this selling must be reflected in the selling price."

From Ohio: "Our business would not be so seriously affected, as we maintain an efficient sales organization including salesmen and dealers. We sell very little direct to farmers

(Continued on page 144)

PORTABLE Does A Permanent Job

Hi-Test Stone Co., Plainsfield, Ill., reopens building stone quarry for the production of agstone and roadstone

Completely portable crushing and screening plant set up in quarry. Plant may be easily moved within loading radius of shovel, to the right

UNTIL about 1870, the Spangler quarry, 2½ miles northeast of Plainsfield, Ill., furnished building stone for numerous farm and urban structures in the vicinity. Now, 76 years later, this old-timer has resumed production to meet the demand for agricultural limestone. The new operator is the Hi-Test Stone Co., organized in November, 1945, and in production in early August, 1946.

Quarry equipment is a portable setup but the rock tonnage available at the present quarry will last the life of the equipment. Assembling the various items for the 400-ton-per-day equipment entailed considerable ingenuity in locating and acquiring new and used items from a variety of sources. However, the basic production units are new equipment.

The primary crushing unit is a completely new Austin-Western while the secondary unit was assembled by Austin-Western, using items available from various manufacturers and powered by a Murphy Diesel acquired from Navy surplus. The roadstone stockpiling conveyor was made up by mounting an 18-in. belt conveyor, 60 ft. centers, on a used truck and the all-purpose TD40 International bulldozer originally had a snowplow mounting for the city of Joliet. All conveyor motors are powered by a 53-hp. Caterpillar Diesel.

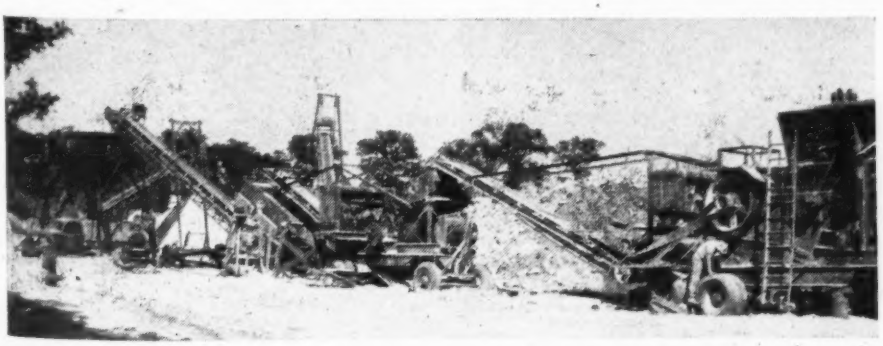
The limestone formation is of the Niagaran series and probably a part of the upper Joliet formation, being a thin-bedded, fine-grained, buff colored seam, averaging 18 ft. in thickness with a shallow 30-in. loam overburden. The rock is chert-free and selective handling would provide building stone rock if required. The present quarry face is about 500 ft. in length on an 8-acre tract, with an additional 100 acres leased to the South. The limestone has a soil sweetening value of about 105 per cent with 95 per cent $CaCO_3$ and the balance magnesium.

Overburden is removed by contract, using a scraper, and rock is blasted with a single line of holes drilled 5 ft. back from the quarry face on 7 ft. centers. A Cleveland DR30 wagon drill, a Le Roi 315 c.f.m. portable compressor, and detachable 6-lip Timken bits sized 2¾-, 2⅝-, and 2½-in. comprise the drilling equipment. An 80-hole blasting shot across the face usually furnishes about 5000 tons of rock using 2- x 16-in. 40 per cent American Cyanimid gelatin dynamite detonated with Primacord. Initial breakage is good enough to practically eliminate secondary blasting.

A 1¼-cu. yd. Manitowoc shovel handles the blasted rock into the 20- x 36-in. Austin-Western primary (50 t.p.h.—3-in. disch.) jaw-crushing unit powered by an International UD18 Diesel. On the secondary crushing unit a 3- x 5-ft. Seco vibrating screen bypasses the minus ¾-in., with the oversize (about 50 per cent) going through a 30- x 30-in. Gruendler 3XD pulverizer. All the rock is then screened by a 4- x 12-ft. Seco vibrating screen, ¼-in. openings, with the undersize going to the 20-cu. yd. agstone loading bin and the oversize to the auxiliary 18-in. belt conveyor, 60 ft. centers, roadstone stockpiler. Overrun from the agstone bin is stockpiled by a 24-in. belt conveyor, 56 ft. centers. Stockpile-to-truck loading is handled by a crawler-mounted Barber-Greene self-feeding bucket loader.

Overall daily production per 8-hr. shift averages about 400 tons with 85 per cent agstone and 15 per cent roadstone. The agstone is delivered by individual truck owners to farmers within a 10-mile radius of the quarry with either a Baughman or Flink type spreader used for surface distribution.

The Hi-Test Stone Co. official personnel includes F. B. Steepy, president; A. J. Krings, superintendent; Henry Kiep, secretary-treasurer; and Al Stengele, sales manager, all being residents of Joliet. Operations are to be on a year-round schedule. Special promotion of a building stone market is also on the agenda.



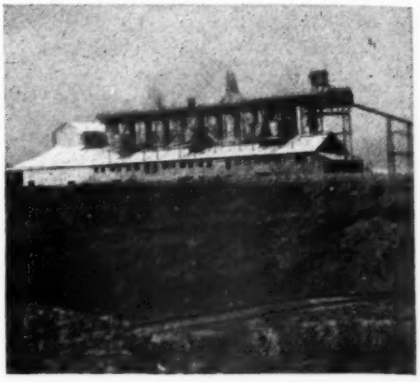
Portable crushing and screening plant: primary crusher, to the right; screening unit in the center; and storage bin and stockpile, to the right

Start Agstone Plant

JOS. J. GRIESEMER, Billings, Mo., is building a limestone crushing plant two miles east of Springfield, Mo., with a siding on the Frisco railroad. It is reported that the plant will cost about $100,000.

Ohio's Treasure In Limestone

National Lime and Stone Company's seven plants produce lime, agricultural limestone, aggregates, glass fluxing stone, steel fluxing stone, and many other products from the famous Ohio Niagaran dolomite formation



Above: Looking at No. 2 lime plant from highway dividing old and new quarries. Tunnel under highway and railroad for kiln cars may be seen to the left. Below: No. 1 lime kiln plant showing kiln car over kilns and incline from old quarry floor

OHIO'S LEADING POSITION in the lime industry is based to a great extent on the high quality dolomitic limestone which occurs in a massive formation in the north central region. This Niagaran dolomite reaches a thickness of 140 ft. in parts of the strata and is of remarkable purity throughout a wide area, often exceeding 99 per cent pure dolomite. This area supports a score of plants in lime production alone, making Sandusky, Ottawa, Wood, Seneca, and Wyandot counties the nation's finishing lime center.

The National Lime and Stone Co., which operates some seven plants in Ohio, offers in the products made at its Carey plant an outstanding example of the prolific uses of Ohio limestone. At this plant the finished products include: lime, agricultural limestone, glass fluxing stone, steel fluxing and refractory stone, concrete aggregate, agricultural "meal" and washed stone sand. An unusual feature of the quarry operation at Carey is the separation made between the upper Monroe formation of caprock, which is about 18 ft. in thickness, and the removal of the main Niagara formation now being quarried with a 77-ft. vertical face.

Caprock has a relatively light overburden of from 5 to 10 ft. of dirt with very thin rock bedding planes, and is removed and processed in a separate plant for railroad ballast and washed sand as finished products. Blast holes are drilled with Loomis drills with 18-ft. spacing between the 6-in. holes, and blasting is done with Primacord, the bottom one-half of the blast hole being loaded with 5- x 16-in. King Powder Co. Detonite and the remainder of the hole with American Cyanamid 5- x 24-in. 60 per cent straight gelatin dynamite. Four rows of holes with 12-ft. spacing between rows are shot simultaneously.

A Marion No. 70 shovel with a 2½-cu. yd. bucket loads the broken caprock into two 15-ton capacity Euclid Diesel trucks for a 500-ft haul to the Allis-Chalmers No. 10 gyratory crusher at the caprock stone plant. The contact zone between the caprock and lower Niagara dolomite is somewhat uneven but not enough to handicap truck hauling. Caprock production is about 200 t.p.h. and the present working face is about 500 ft. back from the main quarry face.

The primary gyratory crusher for the caprock is set for a 5-in. discharge onto a 4- x 8-ft. Tyler screen which scalps over 4-in. to a secondary Allis-Chalmers No. 7½ gyratory crusher and the combined products are separated on a triple-deck Ty-rock 4- x 14-ft. vibrating screen. The top screen with 2¼-in. openings sends the oversize either to the No. 1 rock storage

Left: Loading 15-ton end dump trucks with 4-cu. yd. shovel. Center: Looking down into quarry with drills operating above. Right: Carey quarry face showing 18 ft. of cap rock over 80 ft. of dolomite

Left: Marion plant where aggregates are produced and ready mixed concrete is distributed. Center: Main stone plant at Carey, with live storage to the left and overhead conveyor to glass fluxing stone and agricultural "meal" plant, to the right. Right: Spore plant where aggregates and agstone are produced

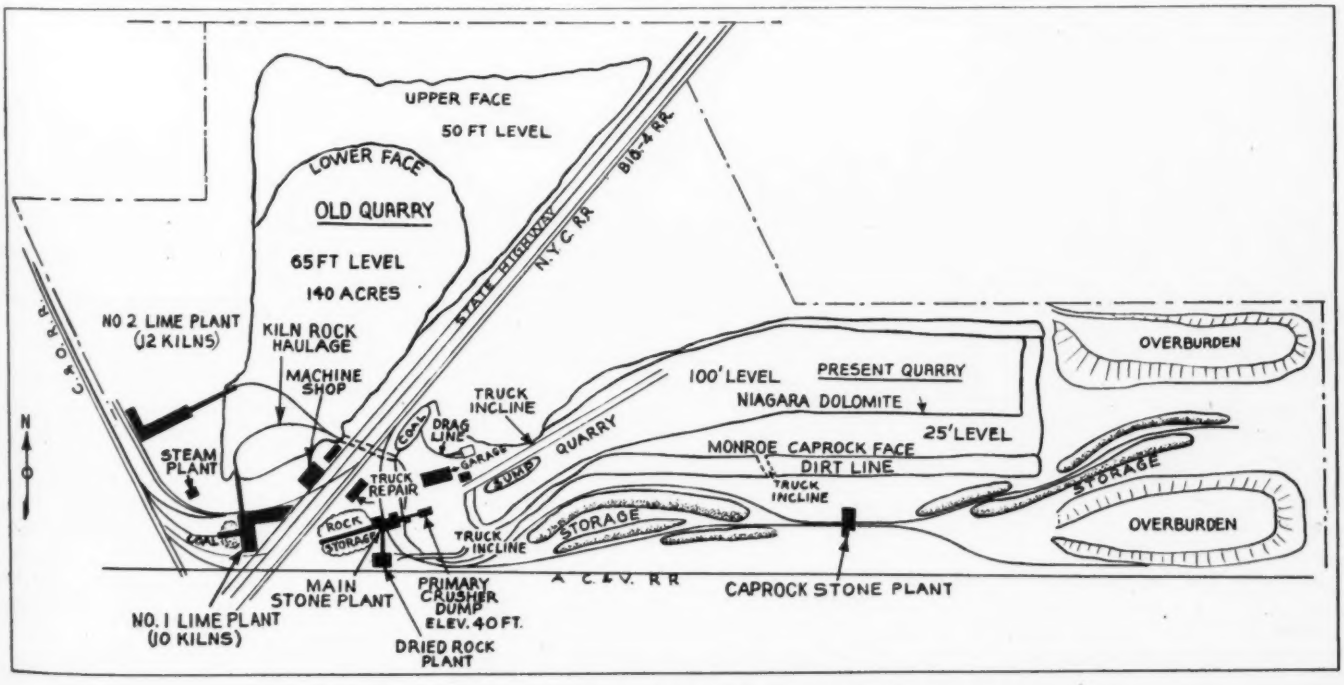
or to a 4-ft. Symons cone crusher for further reduction. The two lower screens with 1½-in. and 1-in. openings, respectively, separate out minus 2¼-in. to plus 1½-in., and minus 1½-in. to plus 1-in. as railroad ballast sizes. Stone through the bottom 1-in. screen is processed in an Eagle 12- x 24-in. pulverizer to eliminate chips and slivers. Discharge from the pulverizer is screened on two sets of 3- x 6-ft. double-deck Hum-mer screens. The top ½-in. opening screen returns plus ½-in. to the pulverizer while stone through the ½-in. screen retained on the 3/16-in. openings of the bottom screen is sized as No. 6 aggregate. The minus 3/16-in. stone is discharged into a 16- x 16-in. New Holland roll crusher for further reduction and this product is screened on 5-mesh size washing screen with the oversize separated as No. 9 aggregate and the through product going to a Webster sand drag type classifier. Washed sand meets state specifications for M-2.11 sand.

Blasting Technique

Although the Niagara dolomite underlying the caprock has an indicated maximum thickness of about 140 ft., the Carey quarry operation has practically standardized on a 77-ft. height of face. The 6-in. diameter blast holes are drilled with two Loomis electric powered drills. Holes are spaced 23 ft. apart about 13 ft. back from the face and a single row of holes blasted each shot. With a 2000-ft. length of quarry face the usual blasting practice is to shoot down half the length of the face at one time. As the dolomite is massive in character with practically no continuous bedding planes, a special blasting technique is required.

Drill holes are bottomed about 5 ft. below the actual quarry floor to insure a clean breaking toe and the Rockmaster shooting method instituted two years ago smoothed out the rock breakage problem very nicely. Triple detonating insurance is the standard practice, using two electric blasting caps at the bottom of each hole and a Primacord detonating fuse the full length of the hole. The Primacord is not the primary detonator in the initial firing but is misfire insurance if an individual hole fails to fire.

Type A and B Atlas Rockmaster split second detonators are used with an alternating hole sequence. Holes are loaded with the bottom two-thirds filled with 5- x 16-in. King Powder Co.



Plant and quarry layout at Carey, Ohio, with lime plants to the extreme left

Detonite and the top one-third of the hole with 5- x 24-in. American Cyanamid 60 per cent straight gelatin dynamite. The top 12 ft. of the hole, however, is used for tamping space only. If the character of the top of the seam appears to warrant it a few sticks of dynamite may be loaded in the top 12 ft. to insure good top breakage. The successful use of the Rockmaster system has decreased the secondary blasting crew from the former total of seven men down to two men and added to the loading shovel actual time on production. Rock breakage is such that practically all the primary blast can be handled by the 4-cu. yd. Bucyrus-Erie electric shovel.

Five 15-ton capacity Euclid Diesel end-dump trucks haul the dolomite from the shovel to the 48- x 60-in. Allis-Chalmers primary jaw crusher in the main stone plant. The average one-way haul is about 1500 ft. against a maximum grade of 3½ per cent with the crusher receiving hopper 60 ft. above the dolomite quarry floor. Quarry production averages about 400 tons per hour with a 14-in. crusher discharge opening.

The initial sizing operation is performed with a revolving screen. The first section of the screen has 6-in. openings through which the undersize goes to the main stone plant elevator. The second section of the revolving screen with 12-in. openings drops the 6- x 12-in. sized stone into the lime plant bins for eventual transfer to the lime kilns. The 12-in. oversize is discharged at the end of the screen into a No. 6 Allis-Chalmers gyratory crusher with a 4-in. discharge opening. This secondary crusher product is then elevated to the top of the main stone plant to a double-deck 4- x 12-ft. Robins vibrating screen which scalps off the plus 2-in. over the top screen for No. 0 and No. 1 sizing, through the top screen and on the bottom 1-in. opening screen is further sized for No. 3 and No. 4 rock, and through the bottom 1-in. screen is sized for No. 6 and No. 7 rock.

The plus 2-in. scalpings are separated into No. 0 (minus 6-in. to plus 4-in.) and No. 1 (minus 4-in. to plus 2-in.) by a single screen. The No. 3 (minus 2-in. to plus ⅜-in.) and No. 4 (minus 1-in. to plus No. 4) are sized on a battery of four Symons 4- x 12-ft. screens and the No. 6 (minus ½-in. to No. 8) and No. 7, (minus ½-in., plus ⅜-in.) sizing are made on twin Niagara 3- x 6-ft. screens. The latter six screens allow for a wide latitude in final size preparation requirements as to percentage of each size required. In addition the No. 3 and No. 4 sizes may be recirculated through 4-ft. and 3-ft. Symons cone crushers in order to increase the production of the smaller No. 6 and No. 7 sizes. The main stone plant has eight 120-ton capacity overhead rock storage bins and a 50,000-ton outside storage pile with a reclaiming tunnel belt conveyor. The reclaiming storage is used mainly for the larger size stone which can be reprocessed into the smaller sizes. The No. 7 sized stone is used either as agricultural limestone or put through a Williams hammermill for processing as glass fluxing stone.

The main stone plant operating from the Niagara dolomitic seam thus produces all sizes of concrete coarse aggregate, lime kiln stone, agricultural limestone, agricultural "meal," and glass fluxing stone, achieving a maximum of versatility on dolomitic limestone. Total rock storage capacity is augmented by outside storage along spur tracks on the plant property. This rock is handled by a railroad clamshell and storage capacity is over 2,000,000 tons, if required.

Interesting Features of Lime Kiln Operation

Since the original quarry and lime kilns are located across the State Highway and the paralleling New York Central (Big 4) Railroad running northeast and southwest, it was necessary to tunnel under these to the new quarry to the east. This tunnel is the passageway for the kiln rock and coal delivery to the lime kilns. The 3.3-ton side dumping kiln cars, loaded under the kiln rock storage bins at the main stone plant, are drawn by Plymouth gasoline locomotive to the old quarry floor level and raised by cable hoist to the top of the kilns for either the No. 1 or No. 2 lime plants. The producer gas coal for No. 2 lime plant is also delivered in the same manner from the overhead coal storage bins which are filled from ground level railroad hopper cars. Coal for the No. 1 lime plant stoker-fired kilns is delivered by railroad to an outside storage with a monorail clamshell to the kiln stokers.

The No. 1 lime plant has 14 vertical Arnold & Weigel kilns 10½ ft. in diameter, 50 ft. high, each normally holding about 50 tons of kiln rock. Calcined rock is drawn out the bottom kiln gate as lime about every two hours in ⅔-ton lots. On 24-hr. operation, lime production per kiln averages 10 tons. The calcined rock is wheeled in a gasoline engine operated drawtruck to the picking table hopper at floor level where it is picked up by a slow moving pan conveyor and underburned rock removed by hand for further kiln processing. Final crushing of the lime at the No. 1 plant is done with a Williams No. 2 hammermill, and the lime is then ready for sacking and shipment.

A diversification of finished lime products calls for a more complicated operating setup at the No. 2 lime plant. Both kiln rock and coal for the producer gas firing is delivered from the regular overhead kiln rock dumping track. Three R. D. Wood producers supply the 12 kilns with gas fuel using ½- to 1½-in. coal for the gas production. Two producer units normally supply the 12 Arnold-Weigel 80-ton capacity kilns, each of which are 12 ft. in diameter and 60 ft. high, and require a total of 20 to 24 tons of coal per 24 hours for the No. 2 lime plant production. Producer gas is supplied at 4 oz. pressure and steam is introduced around the firing ring at 40 lb. pressure to secure higher kiln-firing efficiency.

About 1¼ tons of calcined rock is drawn from each kiln every two hours making the production about 15 tons per kiln in 24 hours. Kiln discharged rock is placed on the picking table similar to the No. 1 plant operation and discards recalcined.

Calcined lime rock from the picking table goes to a Sturtevant rotary fine crusher of 15 t.p.h. capacity from which it is sent to two Bates 4-bag machines for packing as regular lime. However, when the customer requires extra fine lime processing it is placed over a battery of three Tyler Hummer screens in closed circuit with two Allis-Chalmers hammermills. The first screen is usually No. 10 with the following two screens either No. 16 or No. 40. This extra processing is usually required for glass lime and brick mortar lime. Supplementary packing machines consist of one Bates 2-bag and one Bates 3-bag packers.

Hydrated lime is produced in a 5 ring-height Schaeffer hydrator followed by two Raymond mills, and is stored in three hydrate tanks 32 ft. in diameter and 50 ft. high, each holding 800 tons.

In addition to the Carey plant, the National Lime and Stone Co. operates seven others. Plants at Findlay, Lima, and Marion include ready mixed concrete units in addition to the limestone quarry production for agstone, and crushed limestone as at the Oceola, Rimer and Spore locations. The Carey operation is supervised by Jack Reynolds, general superintendent; Cyril Baker, assistant superintendent; and R. B. Vogel, chief chemist. The other plant locations are under S. H. Friesner, general superintendent. The president of the National Lime and Stone Co. is B. E. Emery; L. G. Love is vice-president; V. C. Lytle is treasurer; and D. G. Slee is manager of agstone plants.

Stockpiling Agstone

TO ASSURE FARMERS a supply of agricultural limestone when they want it spread on the soil, a bulletin, "Liming Ohio's Acid Soils" by Earl Jones, extension agronomist, Ohio State University, recommends that dealers set up stockpiles during the spring or early summer. In this way, they will have enough liming materials to supply the demand during summer and fall.

EFFICIENT USE OF AGRICULTURAL LIMESTONE

Sweet land agriculture involves the use of limestone as a basic principle of farm management, resulting in higher production of crops having greater nutritional value

By B. J. FIRKINS*

FROM the fact that the Midwestern states use fully 75 per cent of the total lime consumption in the U. S., it is evident that the region subscribes to a sweet land agriculture system rather than acid land agriculture. Sweet land agriculture means a system involving the use of limestone as a basic principle of management. Not only does this make possible the more efficient production of essential feed and soil conserving crops, but also such crops have a greater nutritional value. The advantages of the former far outweigh those of the latter. In evaluating these systems one must take into account the following considerations:

1. Calcium as a nutrient for plants as well as in relationship to animal nutrition.
2. The importance of adjusting the soil reaction to permit normal biological activity involving:
   a. Nitrification—The biological process whereby available nitrogen is released upon the decomposition of organic matter in soils.
   b. Nitrogen-fixation — Process by which organisms, living independently in the soil or in the nodules on the roots of legumes fix atmospheric nitrogen and make it available to plants.
   c. Availability of mineral nutrients —Calcium, phosphorus, potassium, magnesium.
3. The establishment of successful legume stands in the rotation.
   a. Essential to an adequate conservation program.
   b. Essential to the production of high protein crops for feeding purposes.
   c. Essential in maintaining nitrogen and organic matter in soils.

On the basis of these considerations the only justifiable conclusion is limestone is fundamental for a permanent agriculture in the corn belt or any other humid region. Also we might be safe in stating that everyone is in agreement on all major points.

Now for a little while let us consider the matter of reconciling some differing viewpoints relative to the purposes of liming and measuring needs. As a preliminary to this brief dscussion, however, first consider the situation in an acid soil.

1. There is a deficiency of calcium.
2. There is a high concentration of exchangeable hydrogen which interferes with calcium absorption.
3. Increased hydrogen results in an increased intake of such elements as manganese, aluminum, zinc and iron.
4. There is a lower intake of phosphorus and potassium with increased acidity.
5. There is retarded biological activity.
6. There are effects on certain microorganisms especially fungi which may determine disease prevalence.

Fundamental Purposes of Liming

A. Adjusting the soil reaction

In some states, notably Wisconsin, there has been a feeling that if the reaction was adjusted to a level of pH 6.5, conditions would be favorable for maximum biological activity and availability of soil nutrients. Here it would seem that the adjustment of the reaction to a certain level is the major consideration and if you do this everything else is taken care of.

B. To supply available calcium

Some argue that acidity as such is not injurious and that hydrogen becomes directly toxic only at such low pH values as 3.0-3.5 and consequently the difficulty is due to lack of calcium. Therefore, the major value of liming is in supplying needed calcium. Plant physiologists have demonstrated beyond question, through the use of nutrient solutions, that normal plants may be produced in highly acid solutions if one adds sufficient calcium along with all other essential nutrients.

C. To counteract aluminum, manganese or other toxicity

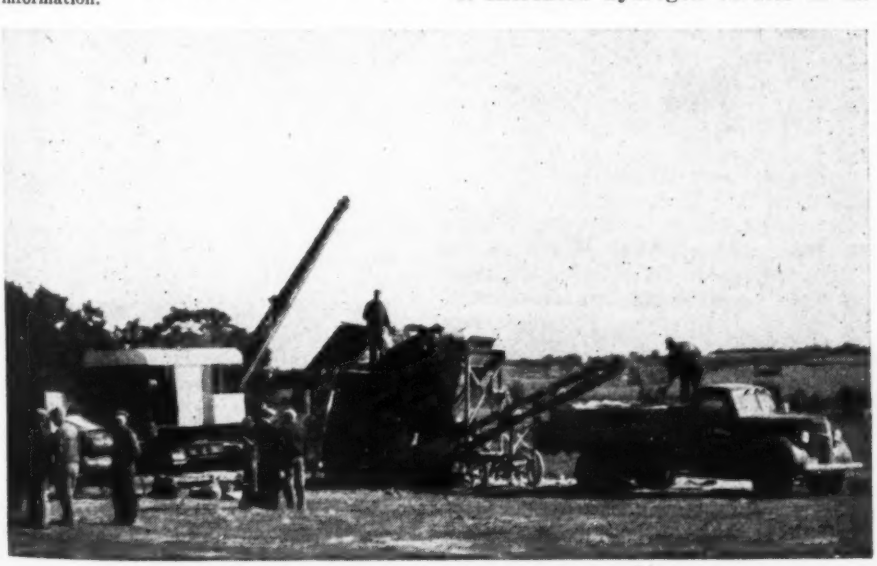
Under certain conditions an increase in hydrogen results in an increased concentration of aluminum or some other element to the point of toxicity. This matter is being given major attention by investigators who are convinced that this is the most important reason for liming.

This is sufficient to indicate that although there may be some difference of opinion on the major objective of liming *the fact remains that if lime is applied it will accomplish all three purposes;* i.e., affect the reaction, furnish calcium and inhibit or prevent toxicity.

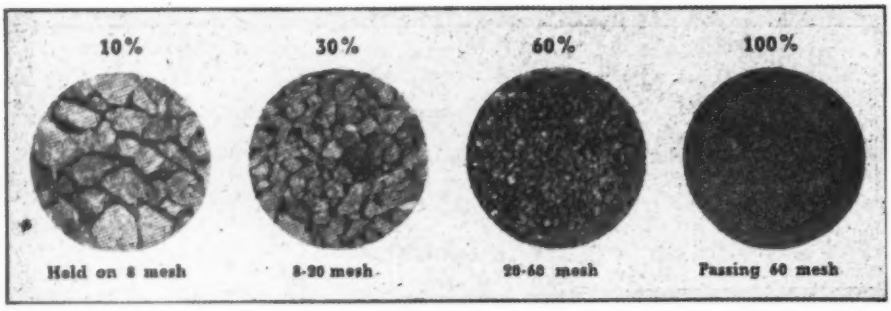
Measuring Limestone Needs

On this point there is a greater divergence of opinion and much work to be done.

*Professor of Soils, Iowa State College. From a paper presented before the recent Agricultural Limestone Division, N.C.S.A., convention in Chicago, expanded to include new information.



Typical small capacity agricultural limestone plant in Illinois



Illustrating availability of limestone particles of different sizes (Per cent availability in 1 to 3 years)

A. Exchangeable hydrogen or pH. By these methods it is quite possible to determine the active and potential acidity of soils and determine the amount of pure lime or equivalent to completely neutralize the soil or adjust the reaction to a certain pH level. It takes 1000 lbs. of pure calcium carbonate to neutralize one milliequivalent of exchangeable hydrogen in the soil. In practice it is not necessary to bring the soil to absolute neutrality and therefore such measurements serve only as a guide in making recommendations under actual field conditions. In testing a considerable number of Iowa soils we have found a close correlation between the pH of these soils and the content of exchangeable hydrogen. I feel confident that if we calculate the amount of average quarry-run limestone needed to neutralize 80-85 per cent of the hydrogen in our soils, it will step up our recommendations by 1 to 2 tons per acre for many soils and this means more business in the future for you producers.

B. Per cent base saturation. In recent years much attention has been given to the base exchange properties of soils. Research workers are accumulating great volumes of data on the exchangeable hydrogen, the exchange capacity, exchangeable bases and degree of base saturation in the profiles of many of the important soils of the country. Where correlations have been run it now appears that a 75-80 per cent base saturation in soils is about optimum for maximum production of the major crops including legumes in this area. Some feel that such determination should be the basis for liming recommendations. M. F. Morgan, now deceased, showed a very good correlation between pH and the degree of base saturation in Connecticut soils. He worked with rather sandy soils of low exchange capacity. In most of our cornbelt soils with higher organic content and exchange capacity such a good correlation is the exception rather than the rule.

C. Lime requirements, more particularly by quick tests such as the thiocyanate tests used in Illinois and Iowa. This is an indirect measurement of the theoretical amount of pure lime or equivalent needed to grow alfalfa or sweet clover, regarded as the least acid tolerant or highest lime requirement crops grown in rotations. There may or may not be a close correlation of results by this method with pH measurements by other procedures. In general, this method has been quite satisfactory in the states where it has been used but there are some cases where it does not work so well. It is planned to do some further research in order to explain the reason for obtaining unsatisfactory results after lime applications are made.

The method is based on the test for soluble iron in acid soils where the intensity of the red color is used to determine the lime requirement. Recently we have encountered situations where the test shows the same requirement where lime has been applied a few years previously. Sufficient lime has not been used to throw all the iron out of solution, consequently the color will develop. Some other method should be used therefore to give us a better guide in making recommendations.

Kinds of Liming Materials Available

Estimates of lime needs have been revised upward in practically all areas. In Iowa for example the needs total 60,000,000 tons to be applied over a ten-year period. That means 6,000,000 tons a year and we are applying around 2.5 million tons, or less than 50 per cent of the needs. One company is now crushing over 700,000 tons for use in Iowa which is over twice the total annual consumption for the state from 1930-1939. It is of considerable consequence therefore to consider the kinds, supply, availability, and quality of materials to meet this demand. Ground agricultural limestone, limestone screenings (from road rock, ballast or building materials) constitute the chief sources. Water purification sludges, beet sugar wastes, cement screenings, button dust and egg shells have been used where they are readily available and cheap.

Quality of Limestone Available

There is a very wide variation in the quality of limestone produced in the states.

a. Formations in the State: Part of the difference may be attributed to the particular geological formations which occur in any region. In the N.E. ⅓ of the state, including the Cambrian, Ordovician, Silurian and Devonian formations, the deposits consist essentially of dolomitic or magnesium limestones, are tan colored and quite soft. They run from 90-106 per cent calcium carbonate equivalent. The shaley limestones of southern Iowa and the cretaceous deposits in the west are very low in magnesium and also average much lower in purity. There is extreme variation in the neutralizing value of limestones from these formations ranging from 60-106 per cent. The average for all producers in Iowa is 90.25 per cent calcium carbonate equivalent.

b. Fineness of division. This is the second major factor determining the efficiency of a liming material. There are no fixed grades or standards in many states in this region of highest consumption.

1. The A.A.A. set up a requirement for Iowa calling for 80 per cent purity or C.C.E. and 90 per cent passing an 8-mesh screen. A material would qualify for full payment when percentage purity or C.C.E. times percentage passing an 8-mesh screen equalled or exceeded a factor of 72. The A.A.A. later specified that 25 per cent should pass a 100-mesh screen, but it had little meaning because the average limestone already exceeded this amount.

2. By a cooperative agreement between the Extension Service and the A.A.A. samples from all producing quarries in the state are submitted periodically to the central control laboratory at the college for tests.

3. From the standpoint of the producer it is assumed that they will put out a product which meets any specifications established by state or federal agencies, organizations, or individuals as long as there is a demand and it can be marketed at a reasonable profit to the producer. Here is one area where the industry and the research worker in particular must work together more closely. The industry might say:

(1) Coarse lime lasts longer and therefore is better to use.

(2) As long as our product meets the specifications of A.A.A. or state agencies and the customer is satisfied —why change?

(3) If we attempt to grind finer it will increase the cost of grinding so much that demand will fall off or the costs will be prohibitive. So far I have had little success in getting cost figures from producers.

(4) If we grind finer it will slow up production and throw output and distribution out of adjustment—particularly during the peak periods.

The research worker on the other hand, having in mind the variations in the formations in the area, the variations in soil types, the relative efficiency of different sized particles,

crop responses, and the time factor in relation to the legume crops in the rotation may contend:

1. That coarse lime has little or no value.

2. That finer lime should cost little more to produce and the consumer should be willing to pay the small additional cost when he knows it pays.

3. It would be highly desirable to establish grades of limestone on some basis and work out a system of evaluating different products by using some factors. Illinois has calculated the screen fineness values for different stones by applying a factor to each sized fraction, (giving the 48-mesh fraction a value of 1.0). In Iowa we have calculated the efficiency by assigning percentage values to each fraction based on the amount which would react in the soil within a period of 1-3 years. This system is discussed more completely in the reprint from the January 1944 *Farm Science Reporter* published at Iowa State College. Ask for FS-86.

These questions involving industry in the capacity of the producer, the research workers, the extension service, action agencies such as A.A.A. and S.C.S. and the consumer are worthy of full and frank discussion. They cannot be answered today but are important enough to justify some conferences of representatives of all groups from time to time. Such a meeting has been held in Iowa in recent years and was very stimulating to say the least. The only suggestion is that they be held more often.

To this point in the discussion of the efficient use of limestone in agriculture we have considered some of the fundamental problems including:

1. Liming as a basic principle of management in a permanent agriculture.

2. The purpose of liming.

3. The question of measuring needs.

4. The types of materials available for use.

5. The basic factors governing the quality of a material; i.e., neutralizing value, fineness.

6. Some of the problems of the producer.

There yet remains a consideration of some practical problems relating to the use of limestone which involve the consumer and the distributor and which have an important bearing on this question of efficiency in the use of limestone.

(A) The place in the rotation. Lime is essentially a soil amendment and not a direct fertilizer for grain crops in rotation. Its primary value is in preparing the land for the successful and efficient growth of legume crops. There is a wide difference in the tolerance of legumes for acidity or the calcium requirement of such crops. Alfalfa and sweet clover on the one hand are high calcium requiring crops whereas lespedeza, crimson clover or even soybeans may make a very satisfactory growth on soils which are quite acid. Yet all will agree that the yield, feeding value and contribution to the soil in the way of returning organic matter and fixed nitrogen will be materially enhanced by the addition of limestone.

(B) Rates of application. In theory we say use lime in accordance with needs as revealed by soil tests. In practice we certainly do not get this much on. Especially during recent war years when production did not keep pace with demand and when A.A.A. practice allowances for individual farms were reduced the tonnage available has been distributed on more acres at a lower rate. pH measurements of 4.0-4.5 or even 5.0 correspond in general with lime requirements of 3½-4 tons, and yet 2-2½ tons per acre represents the average rate of application on most farms. Making up this deficit as well as reliming those areas where the benefits of previous applications have been exhausted indicate a continuing and expanded demand for agricultural lime in the future.

(C) Time of application. Taking into consideration the facts that limestone is slowly soluble in soils, must go into solution to react with soil acids and is essentially used to prepare the land for the efficient growth of legumes the one guiding principle is to apply the lime far enough ahead of the legume seedings to become effective. Six months to a year ahead would not be too much time to allow. And yet when one considers the peak production periods, road and field conditions and present methods of application it must be recognized that this principle cannot and will not be adhered to for the present at least. Far too much lime is being applied to small grain-legume seedings in the spring after the seedings have been made, to second and third year corn ground to be plowed under that year, to rotation pasture or hay land in the summer to be plowed under for 2-3 years of corn and beans before seeding to clover or on bean or corn ground in late fall or early winter after the crops have been harvested. On rolling land this often results in serious losses by erosion. As it now stands the distributor is the key to the situation. The trucker delivers the lime to the farm when he can get it and when your turn comes up and applies it on the land available or where he is willing to drive the truck.

Method of Application

The old days of shipping lime to the nearest railroad in open cars, shoveling it off into bottom boxes, hauling it several miles by team to the farm, hooking on a distributor and shoveling it again, are gone and farmers will not go back to them again. This is the day of heavy trucks with accessory loading and distributing equipment capable of high speed and spreading large volumes in a short period of time. Limestone consists of a mixture of coarse and fine particles and where trucks drive too fast and do not properly overlap in the field it results in uneven distribution of the lime, uneven legume stands and detracts from the efficiency of the practice.

All of these points which have been raised with respect to the application of limestone, directly or indirectly affect its efficient use. The producer, the distributor and the consumer must cooperate in solving these problems of mutual interest. If lime is applied to all the soils that need it for the efficient production of soil building legume crops, if it is applied at rates sufficiently high to do a good job, if it is applied long enough ahead of new seedings to react effectively, and if it is applied uniformly, the value of the practice in agriculture will be materially enhanced and the industry will be assured of a continued and expanding demand.

It should be of concern to you as producers that this midwest area in particular, where consumption is greatest, continues to operate on a "sweet land" basis in which lime is such a fundamental factor in management. It is essential to keep in mind the basic purposes of liming and that improved methods of measuring soil reaction of limestone needs may well result in increasing demands for your product. Keep in mind that the industry is on a competitive basis as long as different materials are available for consumption and great differences exist in the geological formations within a given region as well as differences in the fineness of grinding. And last but not least you should not only be concerned with putting out a quality product but also with its use so that maximum efficiency is obtained by the consumer.

During the war period the lime industry has been in the same position as the fertilizer industry. You had people with ready cash in hand to buy your product, you couldn't produce fast enough to keep pace with demand and someone else did the selling for you. It is not unreasonable to assume that with a future decline in price levels, decreased farm income, no AAA money to pay a large share of the cost of lime in the form of practice payments you may have to put on a selling campaign and work more closely with the distributors. Remember that if you are putting out a quality product at a reasonable profit to yourselves, at a fair price to the consumer and it is distributed in such a manner as to give the maximum results to the consumer, you have a satisfied customer. Such a customer will be your best advertiser in expanding your production in the future.

Existence of Conservation Program Is At Stake

Producers of agstone must present their position to Congress

By D. W. AITKEN*

Spreading agricultural limestone with modern equipment in Mississippi under the Soil Conservation program of the Department of Agriculture

IT IS NOT ALWAYS EASY for business men to know how far to go in urging Government assistance in furthering their interests. The word "subsidy" falls harshly upon the ears of some people and makes them shy clear of being a party to asking the Government for any financial aid which could be so termed.

Yet there has always been favorable public sentiment for the investment of federal funds in projects which are for the general welfare of the nation. It is consequently unreasonable for individuals to let their sense of pride interfere with the accomplishment of good works. If voices are not raised in support of programs which are deemed for the public welfare, it is unlikely that Congressmen or Senators will of their own volition seek out supporters. The very essence of the committee system on which Congress operates is the free expression of public opinion for and against matters that have come up for congressional consideration. There are those who will rise to oppose legislation and deem that they have done their fellow men a great service, while those who give voice to encourage the passing of such legislation seem to think they are engaged in a nefarious activity which will discredit them in the minds of their fellows.

"Squeaky Wheel Gets the Most Grease"

There is much truth in the adage about the squeaky wheel getting the most grease. And Congress is no exception to the proverb's operation. This is as it should be, for a squeak is an indication that attention is needed, the same as pain is designed to call attention to physical maladjustment. Unless the public gives voice to its thoughts at committee hearings, Congress has no way of learning what opinions are harbored by citizens interested in matters of public concern.

Yes, there is one other way, of course, and that is by means of direct communication with a Congressman or Senator by his constituents. On some subjects, such as the continuance of O.P.A. a year ago, the public becomes very voluble and makes extensive use of the prerogative of writing to its congressmen. On other matters, correspondence is desultory and inconclusive and an individual representative is hard pressed to know how his constituents or the people in general feel about a particular bit of proposed legislation.

There is one thing which many Americans do not know; namely, that the federal department which administers a program that has been legislated into existence is responsible only for carrying it into effect and *not* for encouraging its continuance. No matter how attached to a program an administrative official becomes, no matter how convinced he is of the merits of his special "baby," his is neither the responsibility nor the authority to endeavor to perpetuate the program. This has been forcibly brought to the attention of administrative officials, particularly during the present administration. Admonitions of this kind have even been legislated lest administrative officials forget themselves. Unfortunately the blows have not fallen evenly upon all agencies and some have been permitted to sing their own praises while others have been throttled.

Be that as it may, the layman must not depend upon a federal agency to carry the ball on continuation of a worthwhile program. If Congress is to know that the public considers it worthwhile, the public has got to make itself heard through the channels open to it. Unless a program has wide support from the interested elements of the citizenry, there is no reason to expect Congress to vote for its maintenance.

Let us apply these observations to the program about which manufacturers of agricultural limestone probably know most—the agricultural conservation program, commonly called the soil conservation program. It is the farmer on whose soil the conservation practices are carried out who is the direct beneficiary. In the course of the program's operation, the limestone producer and distributor, the fertilizer manufacturer, the farm machinery producer, the dealer in farm supplies, the agricultural engineer and everyone else contributing his wares or his services to soil conservation practices is directly benefited. Indirectly, labor in distant places benefits in the making of the articles used, while nearer at home the whole community profits by reason of the improvement in its general welfare. From the national standpoint, and as the basis for the whole program, there results the conservation of one of our most vital national resources as a benefit to us all.

If the legislator on Capitol Hill in Washington doesn't hear praise of the program from any of the elements benefiting from it, what has he to guide him in making his decision when the subject is before Congress for consideration?

*Formerly associated with the A.A.A., Washington, D. C.

Existence of A.A.A. at Stake

It doesn't take me to tell you that the continued existence of the agricultural conservation program is at stake. The Budget Bureau has blindly and persistently tried to clip its wings for several years, annually putting into the President's mouth words for him to say in his Budget Message. President Truman actually made the following declaration in his recent Message, but I doubt that he was even vaguely aware of the implication of his remarks. The amount involved was too small and the magnitude of his task in preparing a balanced budget too great for him to grasp the significance of these paragraphs:

"A year ago the Budget Message recommended gradual reduction of these payments, and that recommendation is now renewed. More than 60 per cent of the total payments go to about one-eighth of the Nation's farmers. Most of this money thus is being paid to farmers who, because of their strong position in American agriculture, would undoubtedly continue the best farm management practices without the persuasion of a bonus from the Treasury.

"We should shift our effort from this kind of subsidy to providing technical guidance to all farmers for soil conservation and management, along the lines of the Soil Conservation Service and the Extension Service. I therefore propose that the appropriation act limit the conservation and use program for the crop year 1948 to 200 million dollars instead of the 300-million-dollar program to which we are committed for the crop year 1947. This will not affect expenditures materially until the fiscal year 1949."

This was the Budget Bureau speaking, that agency which takes it upon itself to organize the administrative branch of the Government and to decide which programs are beneficial to the nation and which are not, and to what extent they shall be permitted to survive, if at all. It considers itself mightier than the legislative or judicial branches of the Government, a dictator to the President.

In the Soil Conservation and Domestic Allotment Act, on the books since 1936, Congress authorized the expenditure of up to a half billion dollars each year for soil conservation through direct payments to farmers and grants of materials in lieu of cash. But the Budget Bureau has looked with disapproving eyes upon this act of a conservation-minded Congress and annually admonishes it to show a little caution.

It backs up its admonition with fine phrases and high-sounding figures. Too much money going to too few farmers. There's a better way to get the money spent: hire and train technicians who can show farmers how the job should be done. Cut the funds by a third and then let two other agencies take administration of the program away from the agency that has run it for ten years.

You men who have been grinding limestone and spreading it on farms in your communities in cooperation with the A.A.A. over the past ten years know better than anyone else how stupid these recommendations are. You took your trucks during the war over rough terrain to reach those poor farms back in the hills even though you shuddered as you thought of the effect on your truck bodies and tires. That pile of A.A.A. orders that you never seemed to get through didn't represent the best farms in your community. Every farmer whose interest could be aroused in conserving his soil had an order in that pile. Big and small farms, rough and smooth farms, successful and struggling farms—all are in the program.

What Have Other Agencies Done?

To measure the alternatives suggested by the Budget Bureau, let's look at what the other agencies have done in the field of soil conservation. They suggest the Soil Conservation Service and Extension Service.

No one can or wants to deny the splendid job done by S.C.S. It has organized the country into soil conservation districts and tried to keep the farmers within these districts aware of the importance of good soil management practices. It has laid out extensive conservation projects on individual farms, drawn up farm plans and supplied technical assistance, made wide surveys of the erosion program and kept up a steady blast at the general public concerning our long-neglected soil. But how have they touched the soil on the individual farmer's own property? What have they accomplished in terms of acres of soil saved or restored? In this respect their record is well-nigh sterile, because direct action is not of the essence of their program. They use their funds to *run* a program, not *for* the program.

Soil conservation on the individual farm has got to be bought, not because the farmer is stupid or unreasonable but because the idea is new and he has got to see it work on his own farm before he will recognize the benefits to *him*. The soil he is working is the nation's, but for the time being he is master of it, and the nation's welfare depends upon his being convinced that erosion control and soil building are to his advantage as well as to the advantage of the whole country.

A.A.A. Accomplishments Since 1936

Well, it's time to look at the record of the A.A.A. It started out in glory as the Agricultural Adjustment Administration; it dropped in prestige and financial resources to become the Agricultural Adjustment Agency; now it has slumped into ignominy with the complete loss of its identity and even its name, to become the Field Service Branch of the Production and Marketing Administration. But it will never lose the designation A.A.A., because those three A's have come to mean to the farmer a community undertaking with federal backing looking toward saving the soil.

The latest available statistical summary covering A.A.A. activities is for the year 1945. Let's see what they did that one year; they gave cash credit for the use of 21,337,826 tons of ground limestone or its equivalent on 11,569,582 acres on 857,014 farms. They also paid a share of the cost of 2,400,549 tons of superphosphate (20 per cent equivalent) on 19,601,043 acres on 1,152,934 farms. These were enormous accomplishments. Yet the funds used to stimulate the use of these materials for conservation purposes amounted to less than 40 per cent of the total amount paid in 1945 for all conservation practices. And these funds were judiciously used, since payment to the farmer was only from 50 to 80 per cent of the total cost of the material. It was no "give-away" program; it was a well-planned and well-executed program of inducing farmers to use soil-building materials on their share of the nation's land resources.

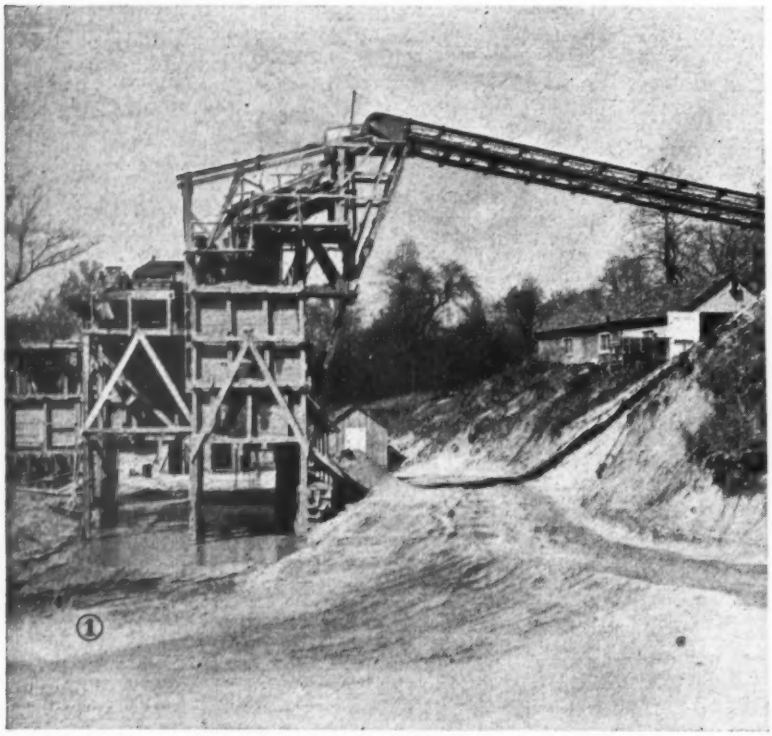
The growth of the A.A.A. program for encouraging the use of conservation materials over the years since it was first authorized in 1936 is nothing short of phenomenal. You have seen the ground limestone figures which show an increase from 3¾ million to 21 million tons and the acreage covered from 2¼ million to 11½ million. And it may interest you to know that the comparable figures for superphosphate are an increase from 200 thousand to 2½ million tons and from 1½ million to 19½ million acres.

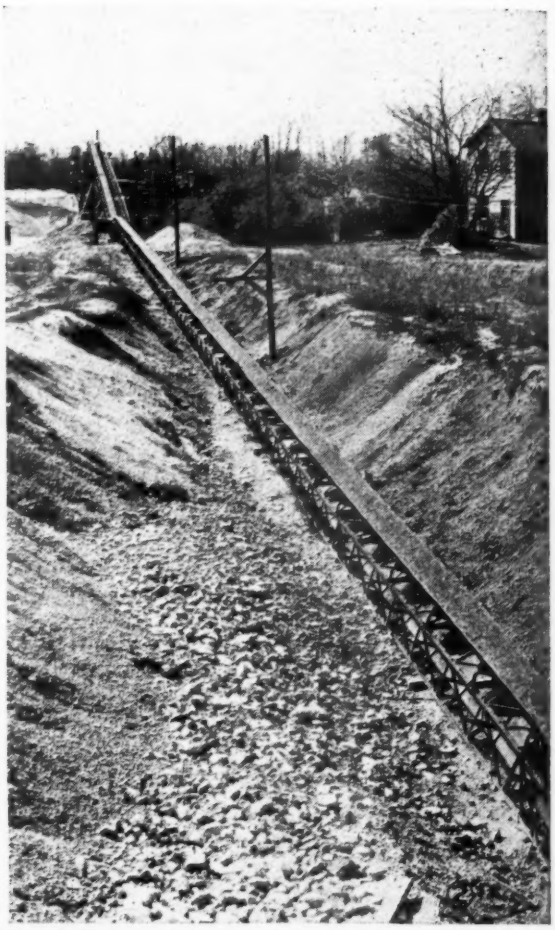
Here we are talking in terms of a million farms and millions of acres in one year, while the programs of S.C.S. just reached the 500,000 mark on number of farms covered over several years. This is no reflection on S.C.S., but it is all the proof needed to show that the direct payment method A.A.A. has used is the only one that *actually gets the job done*. If the goal of soil building and erosion control is worth while, it is common sense to do it the way that accomplishes most in the shortest time. Lavish use of funds for personnel and equipment to run demonstrations is never going to show each individual farmer what the use of soil building materials on his own farm will do.

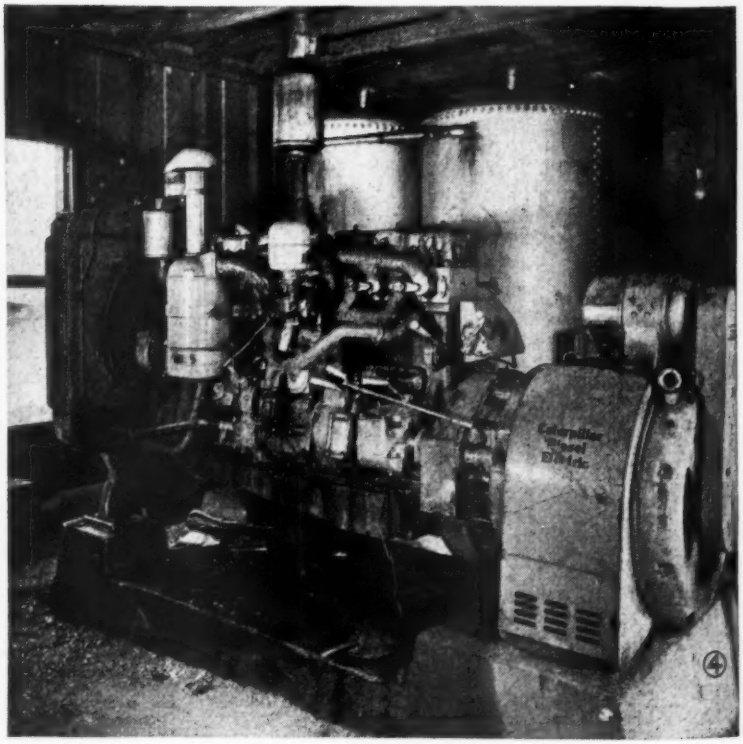
But that's what the Budget Bureau is recommending; technical guidance, they want, and administration on S.C.S. and Extension Service principles. Whether you consider it from the standpoint of the country's welfare or your own selfish interest, you

(Continued on page 140)

AN EFFICIENT SAND AND GRAVEL PLANT



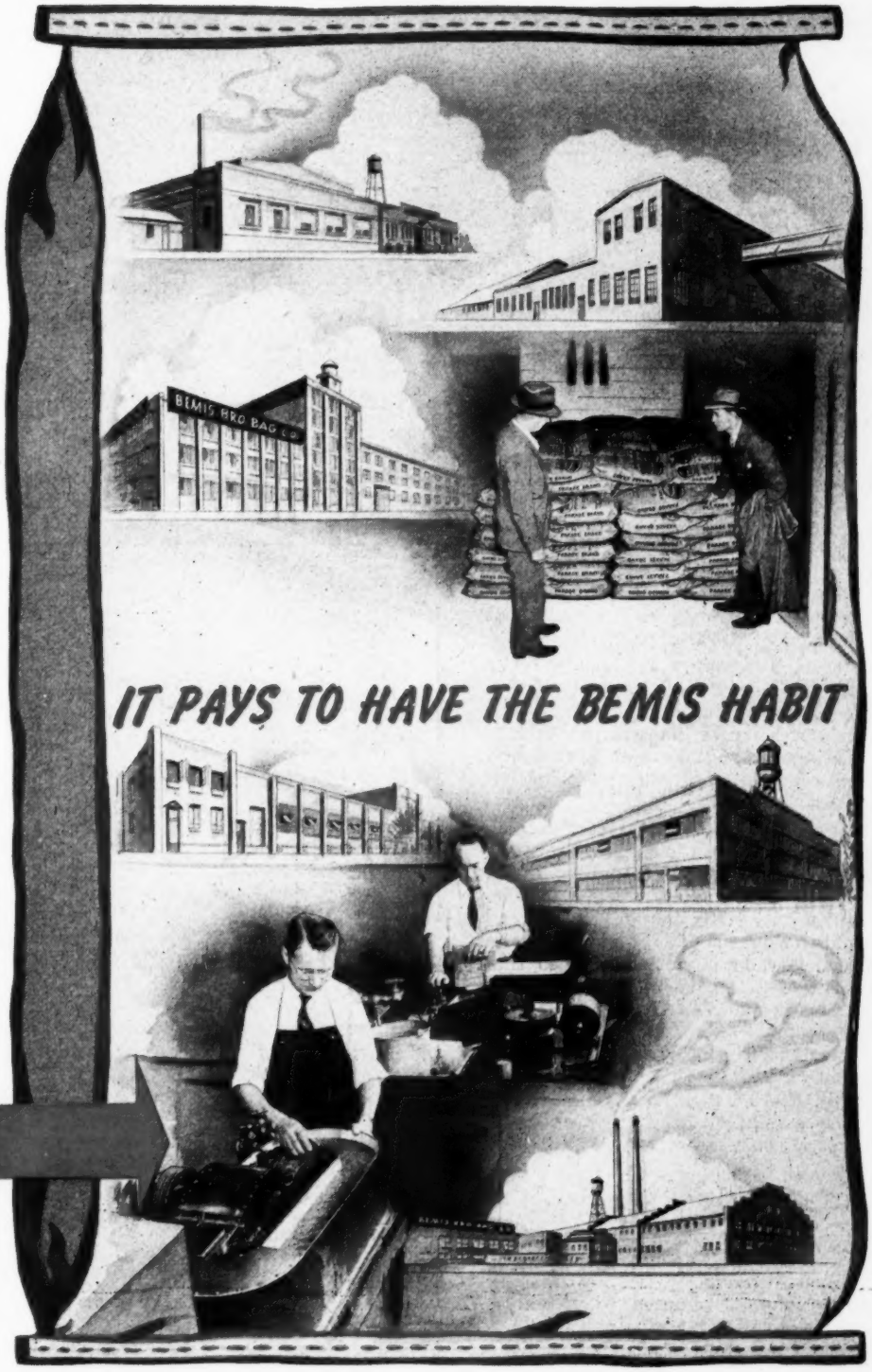




Views of Davis Sand and Gravel Corporation plant at Clinton, Md.

Fig. 1: Showing screening and sand recovery plant with long conveyor from deposit dumping to vibrating screen; sand drag and sand settling tank with flume to waste may be seen to the right. Fig. 2: Long belt conveyor, 454 ft. centers, is in two sections, one horizontal and the other inclining up to the top of plant. Fig. 3: W. Calvin Crawford, vice-president of the company. Fig. 4: A 13-66 Caterpillar Diesel-electric set which furnishes electric power to operate all plant equipment. About 100 tons of sand and gravel are produced per hour

If we could package Bemis Multiwall Service—the brand might look something like this



Bemis' 6 strategically located Multiwall Plants provide a time-saving source of supply no matter where your plant may be. Bemis Packaging Specialists help work out your packaging problems right in your own plant. Often they can improve packing line operations, speed up production, and lower costs. You get all this neatly wrapped up in one complete money-saving package when you choose Bemis Multiwall Paper Shipping Sacks.

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The Problems of Proportioning Portland Cement Raw Mixtures

Part IV — Direct Control of Potential Composition

By L. A. DAHL*

THE FOREGOING STUDY of proportioning methods is concerned with the problem of controlling potential composition in processes in which there is no opportunity for calculating proportions of materials from complete analyses. Complete analyses are required in determining the carbonate requirement, but are not completed in time for direct application to specific problems. However, it has been shown that they can serve a useful purpose if changes in the carbonate requirement occur slowly.

When a complete analysis of each tank of slurry can be made before the slurry is released, combinations of slurries can be made in proportions calculated from the complete analyses. This constitutes direct control of potential composition.

In discussing the indirect method, based upon determinations of the carbonate requirement at regular intervals, it was emphasized that it can be applied only when changes in the carbonate requirement occur slowly. The direct method is not subject to this condition. Since each combination of slurries is made on the basis of complete analyses, abrupt variations in the composition of the raw materials do not interfere with control of potential C_3S or C_2S. In addition, there is the possibility of controlling more than one constituent, as will be shown.

Control of One Constituent

The following data for two tanks of slurry, No. 1 and 2, will be used in illustrating methods of estimating proportions of slurries to obtain a desired potential C_3S, in this case assumed to be 60 per cent.

*Research Chemist, Portland Cement Association.

	Ignited basis		*Unignited (dry) basis*		*Wet basis*	
	No. 1	No. 2	No. 1	No. 2	No. 1	No. 2
Laboratory Determinations						
SiO_2	19.14	26.54				
Al_2O_3	5.66	7.39				
Fe_2O_3	3.48	3.85				
CaO	69.78	60.38				
Carbonates*			78.9	72.6		
Ignition loss			38.21	35.56		
Moisture					32.3	37.1
Calculated Values						
Potential C_3S**	95.6	—11.1				
C_3S deviation	+35.6	—71.1	+22.0	—45.8		

*By rapid control method.
**Calculated by equation 1.

Deviations of the potential C_3S from the desired value, 60 per cent, are shown on the last line of the table. These values are converted to an unignited basis by multiplying by (100—loss)/100. For example, the ignition loss of slurry No. 1 is 38.21 per cent. The C_3S deviation on an unignited basis is 35.6×0.6179, or 22.0 per cent.

Taken in reverse order, the C_3S deviations, on an unignited basis, represent relative weights of the slurries, dry basis, required for a mixture with the desired 60 per cent potential C_3S; that is, 45.8 parts by weight of slurry No. 1 and 22.0 parts by weight of slurry No. 2, each on a dry weight basis, will form a mixture of the desired composition. These relative weights are used in estimating the relative volumes of slurry required and the carbonate content of the mixture, as will now be shown.

Relative volumes of slurry are obtained by multiplying each relative weight, dry basis, by a factor obtained from Table 3. The computations in this case are shown above.

Slurry	Per cent Moisture	Factor (Table 3)		Rel. Wt.		Rel. Vol.
No. 1	32.3	1.09	×	45.8	=	49.9
No. 2	37.1	1.23	×	22.0	=	27.1

From these relative volumes the number of feet of slurry in tanks of the same diameter can be calculated. For example, if 30 ft. of slurry No. 1 is used, the required quantity of slurry No. 2 is $30 \times 27.1/49.9$, or 16.3 ft.

The carbonate content of the mixture may be calculated as indicated below.

Slurry	Relative weights (unignited)		Carbonate Content		
No. 1	45.8	×	78.9	=	3614
No. 2	22.0	×	72.6	=	1597
Total	67.8				5211

$$\text{Carbonate content} = \frac{5211}{67.8} = 76.9\%$$

It is good practice to determine the carbonate content of the mixture, to test the accuracy with which the proportioning has been accomplished. In this case, the carbonate content should be 76.9 per cent. If the value obtained differs from this value to a greater extent than is considered allowable, an adjustment should be made. In deciding upon the degree of accuracy required in this adjustment it should be borne in mind that each 0.1 per cent deviation in the carbonate content is equivalent to a deviation of about 1.4 per cent in potential C_3S.

Graphic Method. The proportions of slurries, on a dry weight basis, required to obtain a desired potential C_3S or C_2S, and the carbonate content of the mixture, may be determined graphically. This is illustrated in Fig. 4 for the foregoing problem. The C_3S deviation, unignited basis, and the carbonate content of each slurry are plotted in the figure as

(Continued on page 124)

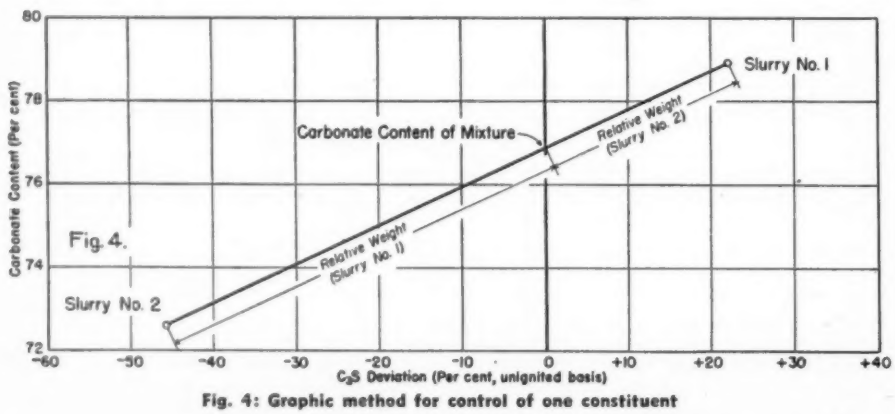

Fig. 4: Graphic method for control of one constituent

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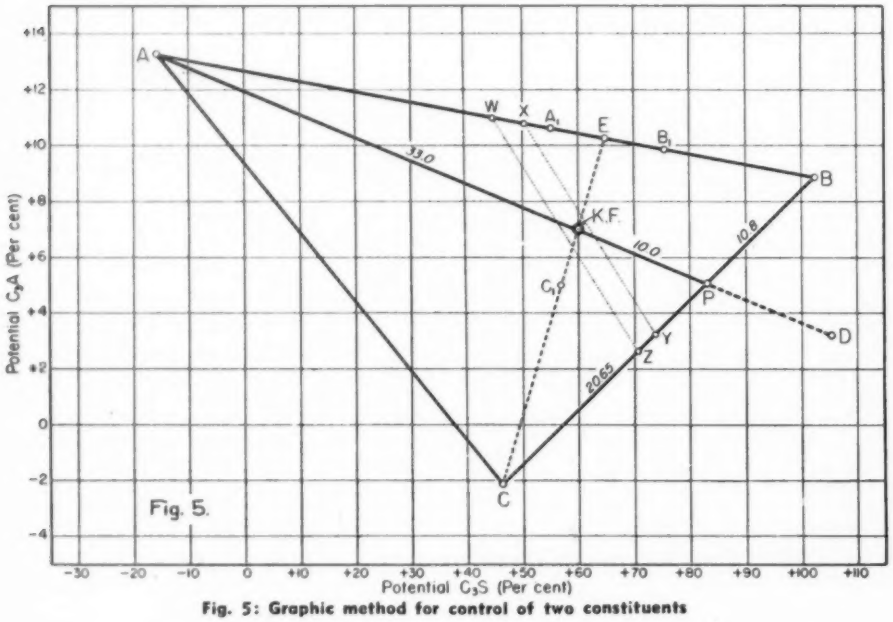

Fig. 5: Graphic method for control of two constituents

indicated at the points designated as slurries No. 1 and 2. For example, the point for slurry No. 1 is located at 22.0 per cent C_3S deviation and 78.9 per cent carbonates. The line joining these points is divided into two segments by the vertical line representing zero C_3S deviation. The lengths of these segments represent the relative weights of the two slurris, dry basis, required to obtain the desired potential C_3S. The segment farthest from the point for either slurry represents the relative weight of that slurry, as indicated in Fig. 4. In this figure only 10 per cent intervals for C_3S deviations and two per cent intervals for carbonate content are shown, but for accuracy in locating points and in measurements a sheet of graph paper is used. In the original graph from which the figure is drawn, the lengths of the segments are 10.1 and 4.85 in. These are the relative weights of slurries No. 1 and No. 2, respectively, on a dry basis.

The line joining the two slurries in Fig. 4 intersects the vertical zero C_3S deviation line at 76.9 per cent carbonates, which is the carbonate content of the mixture.

The relative weights of slurry, on a dry basis, are not identical with the proportions obtained by computation, but they are in the same ratio, which is all that is necessary. They may be converted to relative volumes by the method described previously.

Control of Two Constituents

In considering control of two constituents, it will be assumed that the constituents to be controlled are C_3S and C_3A. It should be understood, however, that the methods which will be described may be applied to any two constituents; for example, to C_2S and C_3A. Estimation of the proportions of slurries to obtain desired percentages of C_3S and C_3A involves three successive steps:

1. The selection of slurries capable of forming the desired mixture. This is performed graphically.
2. Estimation of proportions of the slurries. Since C_3S and C_3A are expressed on an ignited basis, the proportions obtained in this step are on an ignited weight basis. Since graphic methods are particularly advantageous in two-component control, algebraic methods will not be discussed.
3. Conversion of proportions obtained in step 2 to proportions by volume, taking into account the moisture content of the slurries.

Step 1. Selection of Slurries. The method of selecting slurries may be illustrated by referring to Fig. 5. In this figure the C_3A content is plotted against C_3S content. For example, the point designated as *K.F.* is the kiln feed composition, 60% C_3S, 7% C_3A, assumed to be sought in mixtures. Points *A*, *B*, *C*, *D* and *P* represent slurries differing in potential C_3S and C_3A content.† If a straight line connecting any two slurries passes through the *K.F.* point, these slurries may be combined to form the desired composition. It will be seen then that the *K.F.* composition may be obtained by combining slurries *A* and *P*, *A* and *D*, or *C* and *E*.

Slurries which may be combined in pairs to form the *K.F.* composition will be encountered only occasionally. Usually three slurries are required. In that case the *K.F.* composition can be obtained from three slurries if the *K.F.* point is inside the triangle formed by joining the points representing the slurries. For example, slurries *A*, *B* and *C* may be combined to form the *K.F.* composition. On the other hand, slurries *B*, *C* and *D* can not be used, since a triangle joining these points would not include the *K.F.* point.

The graph paper used in the selection of slurries should be large, so that it can be used in step 2, which requires accurate measurements on the diagram. The C_3S and C_3A scales should include all values, positive or negative, likely to be encountered in preliminary slurries. As the composition of each slurry is reported, a point representing the slurry is entered in the diagram, to be erased when the slurry is no longer available. The diagram then also serves as a guide in the preparation of preliminary slurries, since slurry compositions suitable for combination with those already available can be seen at a glance. The preparation of preliminary slurries for two-component control will be considered in greater detail after presenting step 2.

Step 2. Estimation of Proportions (Graphic Method). The graphic method of estimating proportions of materials is an adaptation of a method which has long been in use for the estimation of phases in the interpretation of phase diagrams. The application of this method to the proportioning of cement raw materials was described in 1927 by E. S., W. S., and W. A. Ernst, and in 1929 by R. Grun and G. Kunze.* It was first applied in routine raw mix control by R. M. Willson** and his assistant chemists at the Victorville plant of the Southwestern Portland Cement Company. In their operations the graphic method is used in estimating proportions of preliminary slurries, to secure a final slurry with desired percentages of C_3S and C_3A. The method is illustrated in Fig. 5.

The plotting of slurry compositions (C_3S and C_3A) has been described in connection with the selection of slurries (step 1). The *K.F.* point can be located to represent any desired kiln feed composition, but in this figure it is assumed that 60% C_3S, 7% C_3A, is the composition sought. Points *A*, *B* and *C* represent the three slurries in the table on page 126.

All of the compositions which can be made from two slurries are on the straight line joining the slurries. For example, slurry *P*, Fig. 5, can be made from slurries *B* and *C*. The lengths of the lines *CP* and *BP* are the relative proportions of B and C, respec-

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*Proportioning Raw Materials. Edgar S. Ernst, Walter S. Ernst and Wm. A. Ernst. Rock Products, Oct. 15, 1927, pp. 73-76.

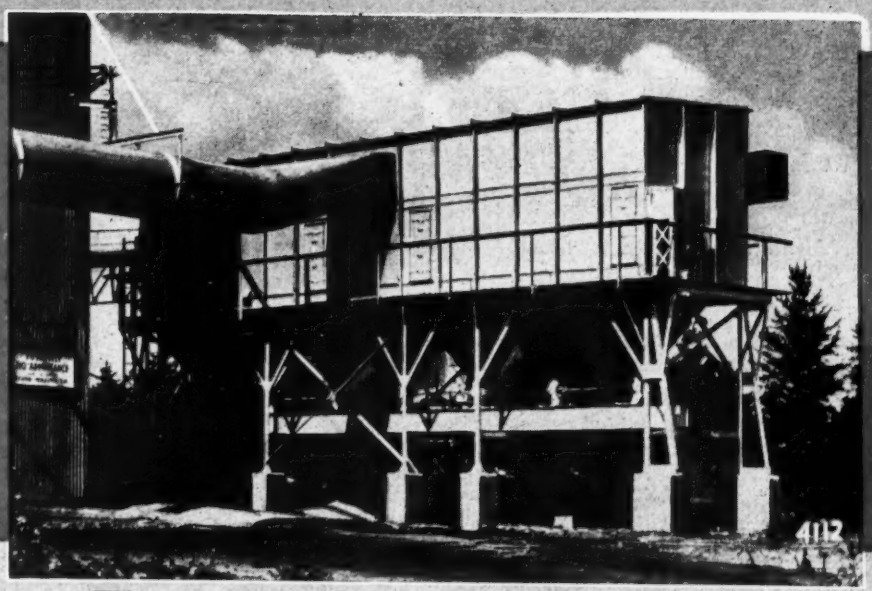
A Graphic Method of Proportioning the Raw Mix. Dr. Richard Grun and Dr. Gunther Kunze. Concrete, Cement Mill Section, Jan., 1929, pp. 115-124.

**Chief Chemist, Southwestern Portland Cement Co., Victorville, Calif.

†The potential C_3S and C_3A are calculated by substitution in equations 1 and 3. These equations will give negative values or values greater than 100 per cent when the constituents can not possibly be combined to form the compounds C_3S, C_2S, C_3A and C_4AF. These apparently absurd values are plotted as though they represented actual percentages of the compounds.

• An Aid to Greater Production

SLY DUST CONTROL



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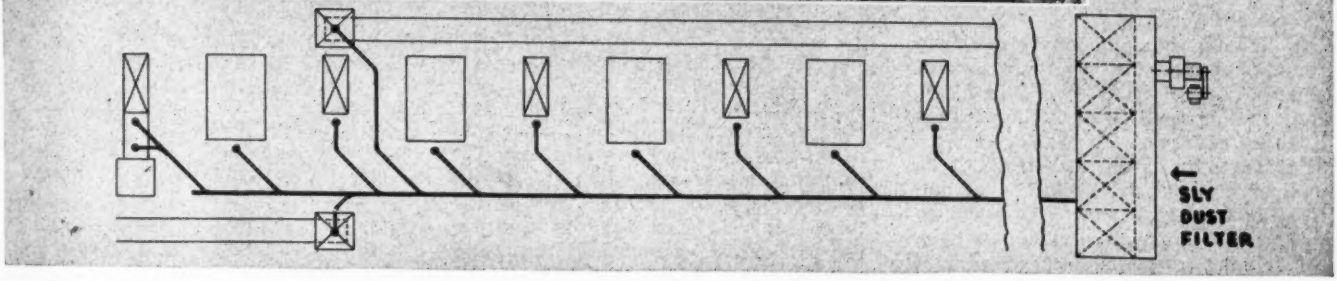

Diagram of connection of Sly Dust Filter with various sources of dust—crushers, screens, conveyors and elevators. At these points dust-laden air enters hoods and is drawn through piping to the filter—dust filtered out and easily disposed of.

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tively, required to form slurry *P*. The lengths of these lines in the original diagram on a larger scale are indicated in the figure. It is seen that 20.65 parts by weight of slurry *B* may be combined with 10.8 parts by weight of slurry C, to form 20.65 + 10.8, or 31.45 parts by weight of slurry P.* Since the diagram is based upon C_3S and C_3A percentages on an ignited basis, these values are on *ignited weight* basis.

	Ignited basis			Unignited (dry) basis		
	Slurry A	Slurry B	Slurry C	Slurry A	Slurry B	Slurry C
	Laboratory Determinations					
SiO_2	26.86	18.66	19.80			
Al_2O_3	7.47	5.55	5.95			
Fe_2O_3	3.86	3.46	10.57			
CaO	59.99	70.40	61.87			
Carbonates*				72.1	80.4	73.3
Ignition loss				35.4	38.4	35.8
	Potential Composition**					
C_3S	—15.7	102.5	46.3			
CA	13.27	8.86	—2.11			

*By rapid control method (acid-alkali or calcimeter).
**Calculated by equations 1-4.

SLURRY (WET) BASIS

Slurry	Per cent Moisture
A	35.3
B	41.9
C	39.7

Following the same procedure, it is found that the relative proportions of slurries *A* and *P* to form the *K. F.* composition are 10.0 and 33.0, respectively If slurry A is to be used with 31.45 parts by weight of slurry *P* (the quantity formed from slurries *B* and *C*), 10 × 31.45/3.0, or 9.53 parts by weight will be required. Thus we have the relative proportions of slurries *A*, *B* and *C*, as follows:

Slurry	Relative proportions (ignited weight basis)
A	9.53
B	20.65
C	10.8

In obtaining the relative proportions on an ignited weight basis, a line was drawn from vertex *A* through the *K. F.* point to *P*. Any vertex could have been selected for the purpose. For example, a line from vertex C through the *K. F.* point to *E* might be drawn, as indicated by the broken line in the figure, and the same procedure followed in estimating relative proportions of slurries *A*, *B*, and *C*. The values obtained will not be the same as those found above, but they will be in the same ratio to one another, which is all that is necessary.

Relative proportions on an ignited basis are converted to relative proportions on an unignited basis by dividing each value by (100 — ignition loss)/100, indicated in table, right.

Slurry	Ignition loss	Rel. proportions (ignited basis)		100 — loss / 100		Relative proportions (unignited basis)
A	35.4	9.53	÷	0.646	=	14.75
B	38.4	20.65	÷	0.616	=	33.52
C	35.8	10.8	÷	0.642	=	16.82

In the footnote to Table 3 attention is called to the fact that the factors for conversion to a volume basis are only approximate. In addition, further errors may be introduced because of the lack of precision in volume measurement of slurry in the plant. If the three slurries to be combined are all close to the desired mix composition, errors from these causes are not likely to be significant, and the calculated relative volumes can be used without further tests. In this case, slurries *A*, *B*, and *C* are not close to the desired *K. F.* composition, and it is necessary to check the proportioning operation by tests for carbonate content. In addition, since this method of checking is valid only for combinations of two slurries, it will be necessary to combine two of the three slurries, testing this mixture for carbonate content and adjusting proportions, if necessary, before adding the third slurry; that is, the operation is carried out in two stages, each involving the combination of two slurries.

The relative proportions on an unignited basis are converted to relative proportions on a slurry volume basis by applying the factors for moisture content from Table 3, as follows:

Slurry	Per cent moisture	Factor (Table 3)		Relative proportions (unignited basis)		Rel. proportions by volume
A	35.3	1.17	×	14.75	=	17.3
B	41.9	1.40	×	33.52	=	46.9
C	39.7	1.32	×	16.82	=	22.2

Before proceeding with a description of the use of carbonate determinations in obtaining correct proportions on a dry weight basis, it should be emphasized that the carbonate determinations do not serve the purpose when three slurries are combined before testing. This is true for two reasons, as follows.

1. The mixture may be far from the desired composition, and yet meet the requirements as to carbonate content. For example all mixtures in the area *WXYZ*, Fig. 5, are within 0.2 per cent of the carbonate content of the *K. F.* composition This includes a wide range of percentages of C_3S and C_3A.
2. If the carbonate content is too far from the *K. F.* composition to be considered satisfactory, the correction to be applied is not known For example, the C_3S and C_3A content of a mixture too high in carbonates is not known. It may be corrected for carbonate content by the addition of either slurry *A* or *B* (Fig. 5). The fact that the carbonate content is high provides no information as to which slurry will bring it closer to the *K. F.* composition. The wrong choice may even bring it farther from the desired composition.

As will be shown presently, there is sometimes a reason for choosing a particular pair of slurries to be mixed first, before adding a third. In the case of slurries *A*, *B*, and *C* there is no particular choice. We may select any pair, and will select slurries *A* and *B* arbitrarily. It will be necessary, then, to determine the carbonate content to be sought when combining slurry *A* and *B*, and when combining this mixture with slurry C. These values are found as indicated above.

MIXTURE OF SLURRIES A AND B

Slurry	Rel. proportions (unignited basis)		Carbonate Content
A	14.75	×	72.1 = 1063
B	33.52	×	80.4 = 2695
Total	48.27		3758

$\frac{3758}{48.27}$ = 77.9 per cent carbonates

MIXTURE OF SLURRIES A, B, and C

Slurry	Rel. proportions (unignited basis)		Carbonate Content
A	14.75	×	72.1 = 1063
B	33.52	×	80.4 = 2695
C	16.82	×	73.3 = 1233
Total	65.09		4991

$\frac{4991}{65.09}$ = 76.7 per cent carbonates

It was found previously that slurries *A*, *B*, and *C* are to be used in the proportions 17.3, 46.9 and 22.2 parts by volume, respectively. The procedure is to combine slurries *A* and

*Since the slurry nearer to the desired composition is used in the greater quantity, the length of the line farther from *B* is the relative proportion of *B*, and the length farther from *C* is the relative proportion of C. This principle is followed in every case.

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B in the proportions indicated, then determine carbonate content. If the carbonate content departs from 77.9 per cent to a greater extent than is considered satisfactory, an adjustment in proportions is made. Slurry *C* is then added to the mixture, and the carbonate content determined. If it departs too much from 76.7 per cent, an adjustment should be made. Because the mixture of slurries *A* and *B* already has been adjusted and the entire quantity is used in making the final mixture, an excess of slurry *C* should be avoided. In deciding upon limits to be assigned to the carbonate content, it should be borne in mind that a deviation of 0.1 per cent in carbonate content is equivalent to about 1.4 per cent deviation in C_3S. By this procedure, with reasonably small limits on carbonate content in each stage, the potential C_3S and C_3A values sought can be obtained with a satisfactory degree of accuracy, even though the slurries to be combined depart considerably from the desired composition.

The Preparation of Preliminary Slurries. In the procedure which has been described, the time consumed in obtaining the desired composition in each stage depends upon the chances of obtaining the calculated carbonate content, within assigned limits, when proportioning by volume. If the carbonate content is correct in most cases, little time is consumed in making adjustments and in testing the mixtures after adjustment. On the other hand, a great deal of time may be consumed in these operations if adjustments are usually required. On that account, some consideration should be given to methods of avoiding frequent adjustments of proportions. When such adjustments are required too frequently, there is likely to be a tendency to widen the limits on carbonate content which will be accepted as satisfactory. This will reduce the frequency of adjustments, but it is not a real solution, since it means the acceptance of a wider range of percentages of potential C_3S and C_3A in the final mixture. For example, if a carbonate content within 0.7 per cent of the calculated carbonate content is accepted as satisfactory, it is equivalent to accepting a range of about 14.0×0.7, or 10 per cent, on each side of the C_3S content sought. The limits on carbonate content should be assigned with reference to the range of values of C_3S which is considered acceptable. If adjustments are required too frequently, other means of avoiding them should be employed. These are concerned with the preparation of preliminary slurries which are combined to form the final mix.

Steps which can be taken to simplify the operations in control of two constituents may be illustrated by reference to Fig. 5. As mentioned previously, slurries *A* and *B* are mixtures of limestone and shale, while slurry *C* is a mixture of the same raw materials, but with high-iron material added to reduce the potential C_3A content. Let us suppose that the limestone-shale mixtures are prepared more accurately than *A* and *B*, so that slurries A_1 and B_1 are obtained instead. Less high-iron material may be used in preparing the third slurry, obtaining a composition such as C_1 instead of C. Since slurries A_1, B_1, and C_1 are close to the *K. F.* composition, the proportioning operation does not need to be carried out as accurately as in the case of slurries *A*, *B*, and *C*. The three slurries can be mixed simultaneously in the calculated proportions by volume, and no test of carbonate content should be required.

The combination of slurries *A*, *B*, and *C* and the combination of slurries A_1, B_1, and C_1 represent two extremes. Accurate proportioning of *A*, *B*, and *C* requires two stages, each subject to check by carbonate determinations, with the necessity of frequent adjustment of proportions. Slurries A_1, B_1, and C_1 may be combined in one operation, without such tests and adjustments. The latter condition may not be attainable with the equipment available in the plant, but an approach to it will simplify operations in seeking reasonably accurate control of two constituents. Anything which can be done to bring preliminary mixtures closer to the desired composition will reduce the frequency with which adjustments of proportions are required, even if the need for checking by carbonate determinations is not eliminated.

There are some instances in which the second stage of the proportioning operation can be simplified by a proper choice of slurries to be combined in the first stage. For example, let us suppose that slurries *A*, *B*, and C_1 are to be combined to form the *K. F.* composition. Since C_1 and *E* are close to the *K. F.* composition, slurry *E* may be made by combining *A* and *B*, with tests for carbonates and adjustment of proportions. Slurries C_1 and *E* may then be combined in calculated proportions by volume, without the need for carbonate tests. If slurries *A* and C_1, or *B* and C_1, are combined in the first stage, conditions are not as favorable for proportioning by volume, and carbonate determinations are required in both stages, with the possibility of a need for adjustment of proportions in either stage.

In the case just described, slurry C_1 is used in greater proportion than slurries *A* and *B*. At some plants it may be convenient to prepare a high-iron slurry with such a high percentage of Fe_2O_3 (low or negative C_3A) that it will be used in small proportions in each combination. The percentage of Fe_2O_3 may be much greater than in slurry *C*, but the procedure may be described with reference to slurry *C*. Let us assume that the limestone and shale, or equivalent materials, are proportioned with a fair degree of accuracy, so that slurries A_1 and B_1 are obtained. Slurries A_1 and B_1 may be combined first to form slurry *E*, without carbonate tests, and slurry *C* may then be added, and carbonate tests applied to insure accuracy. On the other hand, if slurries A_1 and *C*, or B_1 and *C*, are combined first, carbonate tests are required in the first stage. In the second stage they may be found necessary, but the chances are favorable for obtaining the desired carbonate content, with few occasions in which adjustment of proportions is needed. Here there is a choice between simplifying the first or second stage. In general, simplification of the second stage is preferable, since the total quantity of slurry made in the first stage is used in the second stage. An adjustment requiring an additional quantity of this slurry introduces an awkward situation which can be avoided, at least most of the time, by simplifying the second stage.

Oregon Perlite

PERLITE, a form of volcanic glass, is the subject of a geologic report recently issued by the Oregon Department of Geology and Mineral Industries. Perlite pops like popcorn when heated quickly to a high temperature in a furnace and the expanded product is very light in weight, making a superior insulating material. There are several known large deposits of perlite in central and eastern Oregon. Deposits now being developed by Dant & Russell, Inc., and which will soon be in production, are located near the railroad along the Deschutes River in southern Wasco county. The report, GMI Short Paper No. 16, may be obtained at the office of the Department at 702 Woodlark building, Portland, Ore., by sending 15¢.

Flotation Reagents Directory Correction

AMERICAN CYANAMID CO., New York, N. Y., has called our attention to the omission in ROCK PRODUCT'S January annual Directory of Manufacturers of proper listings of the company's name under "Flotation Equipment" and "Flotation Reagents and Supplies." Under "Flotation Equipment" the company's name should be listed as manufacturer of the Fagergren Flotation Machine, the Steffensen Flotation Machine, and distributor of the Clarkson Reagent Feeder. The company also is a manufacturer of a complete line of flotation reagents. It is very much regretted that these listings were inadvertently omitted.

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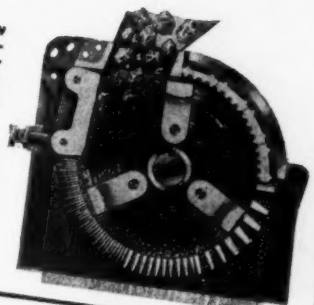

Sectional view shows how material is fed into the Hammermill and struck by the hammers against the breaker plate from which it rebounds into the free-swinging hammers.

ROADSTONE *and* AGSTONE *in one operation!*

This portable hammermill plant is another new Cedarapids portable crushing and screening plant that opens up an entirely new market for contractors and quarry operators. The crushing unit is a 4033 or a 3033 Cedarapids Hammermill that will turn out 20 to 40 tons of agstone or 140 to 180 tons of 1½" material per hour depending upon the size of feed and kind of stone. Or — the portable hammermill plant will produce a percentage of each product all in one closed cycle operation. The agstone comes off the delivery conveyor over the end of the plant while the crushed rock comes out on a side delivery conveyor.

In this installation, the rock is going into a five yard portable truck loading bin that acts as a surge between truck loads. Note the separate power unit for the hammermill which permits a change of speed to suit hammermill performance in various kinds of stone.

The Cedarapids Hammermill not only produces a much finer quality and uniform size of material but will turn out more tons per hour than other similar types of pulverizing equipment of comparable size, and with less maintenance cost. Cedarapids Hammermills are available in 2033, 3033 and 4033 sizes — on skids or portable.

When you buy a crushing plant—buy the best — buy Cedarapids. See your nearest Cedarapids dealer for details.

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IOWA MANUFACTURING COMPANY
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that's right for your jobs!

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With Gardner-Denver Sinkers, use a Gardner-Denver All Water-Cooled Portable Compressor. Complete water jacketing of cylinders assures steady, highly efficient operation under constant load. For complete information, write Gardner-Denver Company, Quincy, Illinois.

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S33

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S45

A 45-pound drill designed for work in medium hard rock where high drilling speed is demanded. A favorite with operators because its easy riding helps eliminate physical strain.

S55

Users call it the most efficient 55-pound drill on the market. It has perfect balance—which means greatest drilling capacity with easy riding and conservative air consumption.

S73

Sixty-seven pounds of speed and power to drill faster and deeper in harder ground. Ask for information about Gardner-Denver heavy sinking drills for shafts.

Gardner-Denver WBH365 Diesel-driven Portable Compressor.

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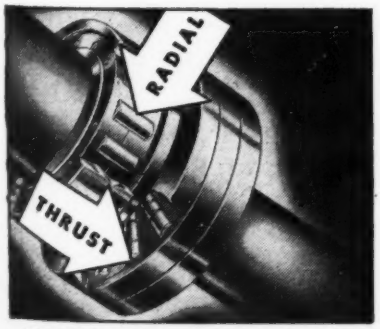
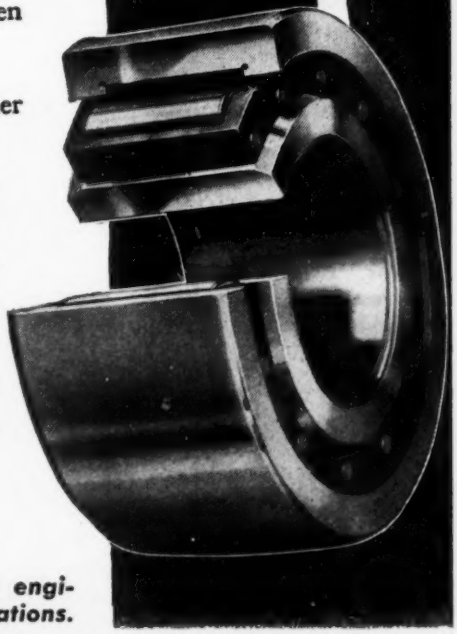
ROLLWAY's Right-Angle-Loaded Bearings have longer life because Rollway uses the principle of *right angle loading*. This splits every load into its component parts of pure radial and pure thrust. Each component load is carried on a separate bearing assembly at a *right angle to the rollers.*

For this reason, Rollway Bearings can use efficiently solid cylindrical rollers of greater mass and cross section area in a given space. The unit load per roller is lower and the load capacity for a given dimensional limit is higher.

As the diagram shows, no oblique loads or resultants, no other compound loads can pile up to increase the magnitude of the simple radial or thrust component. Resistance to shock and vibration is increased. Pinch-out of rollers is eliminated—with less rubbing friction and less wear-back of roller ends. The net gain is clearly apparent in longer bearing life . . . less service attention . . . and lower maintenance cost.



All radial loads carried at right angles to the roller axis. All thrust loads carried at right angles to the roller axis.



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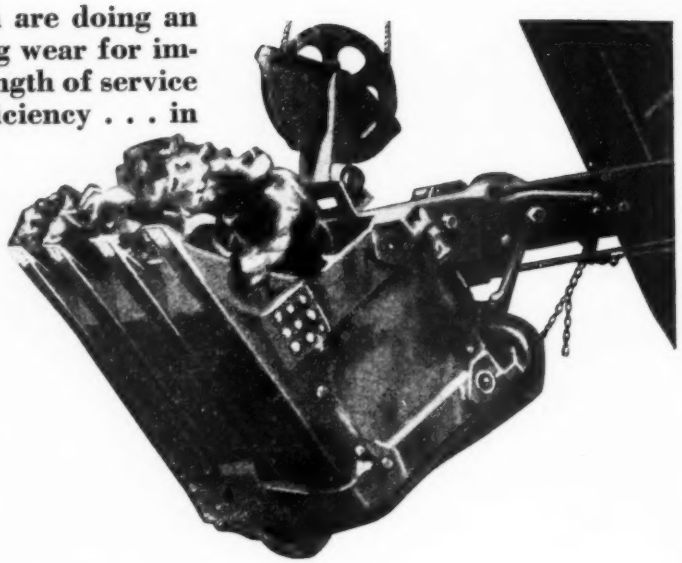

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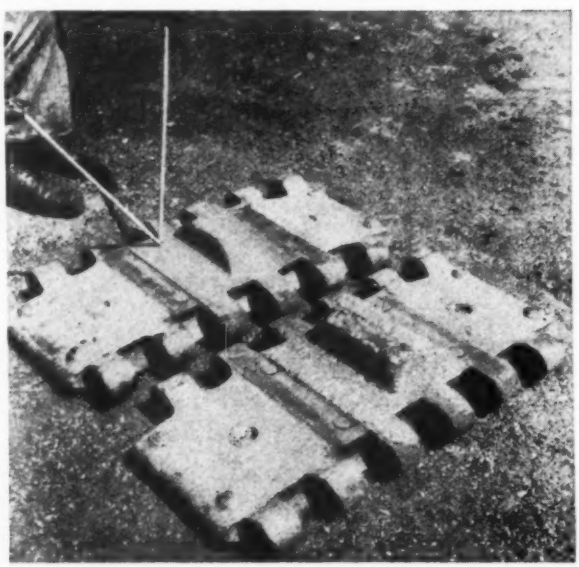

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TWO-TONE H.C.

Filler Rod. High carbon —1.25% alloyed with chromium, molybdenum and vanadium. Drawn wire.

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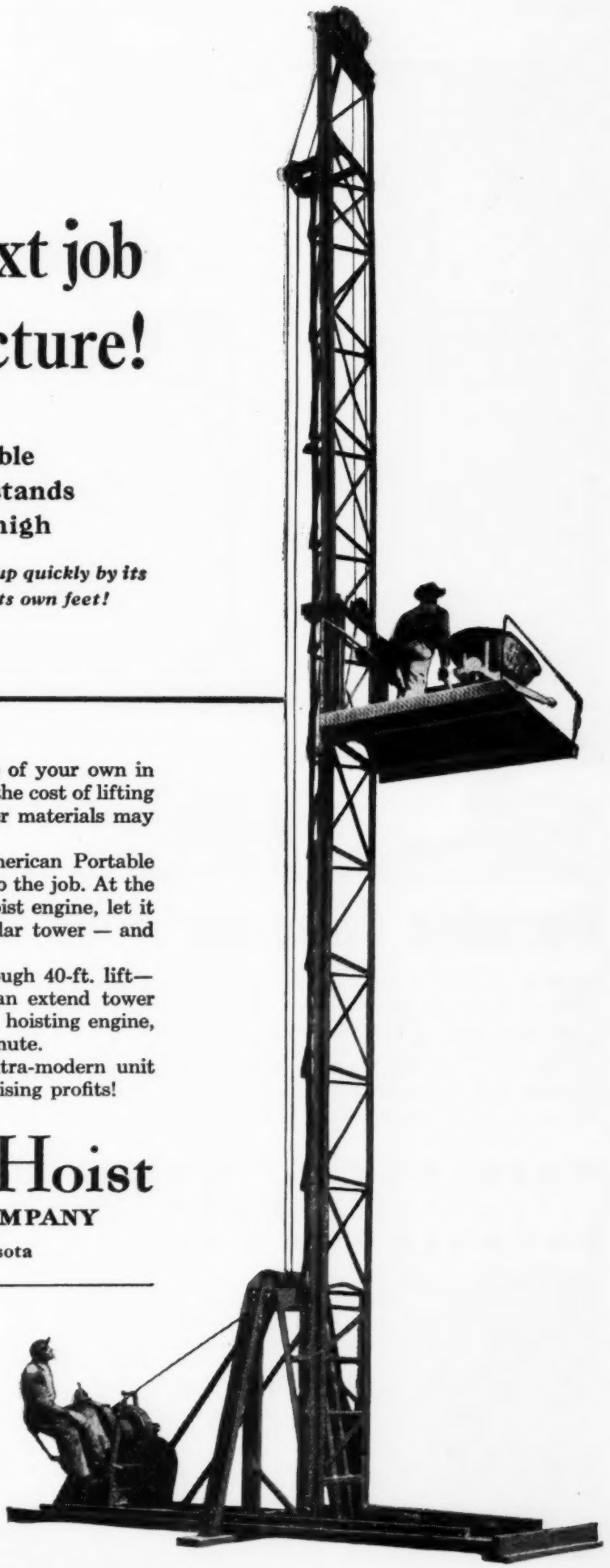

● Just imagine some specific job of your own in this background . . . a job where the cost of lifting brick, mortar, cement and other materials may make or break your profits.

In jig time, you load the American Portable Material Elevator, and move it to the job. At the building site, simply start the hoist engine, let it raise the sturdy, welded triangular tower — and you're ready for action!

Elevator platform travels through 40-ft. lift—and two added mast sections can extend tower height to 67 feet. With 18 H. P. hoisting engine, platform speed is 87 feet per minute.

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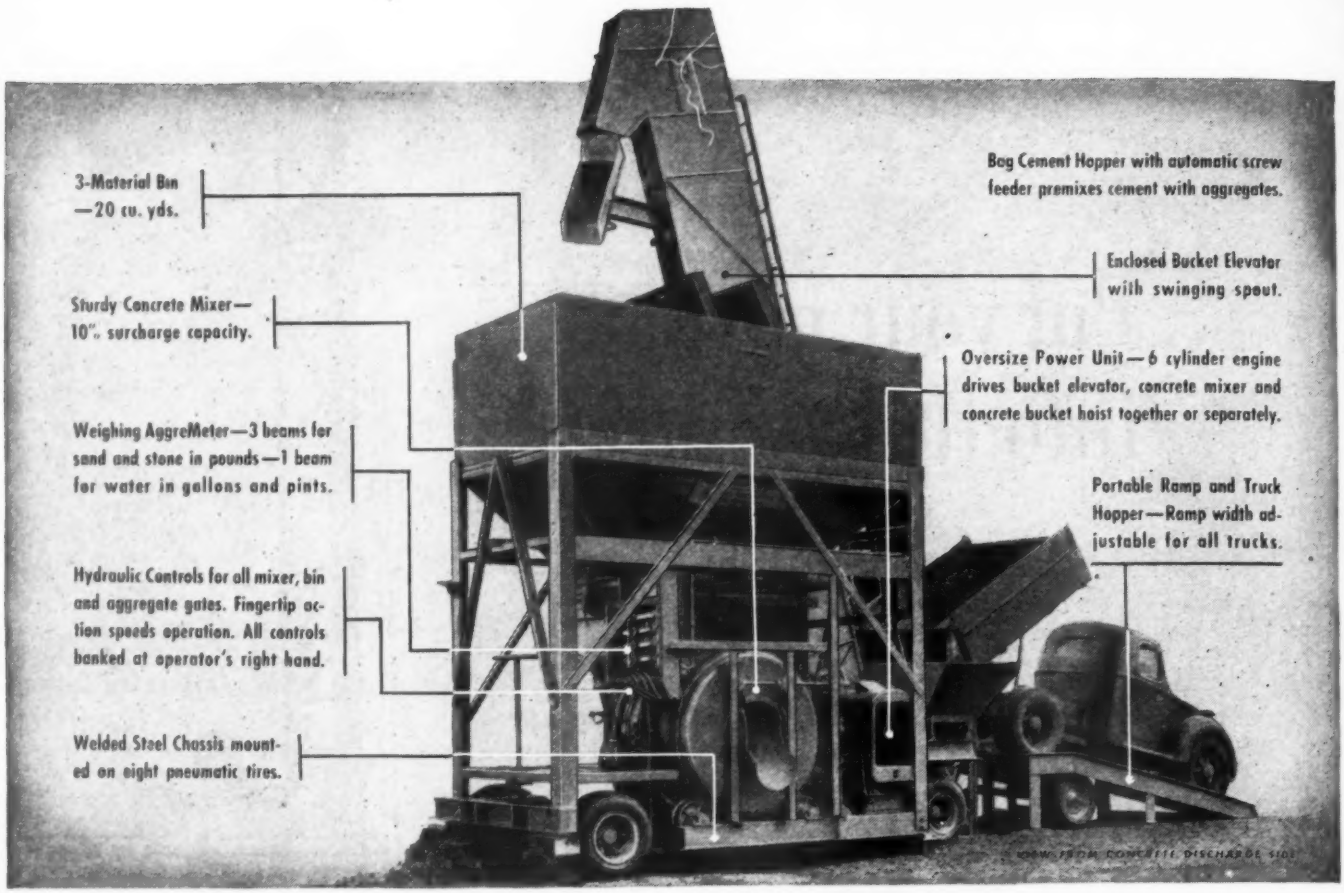
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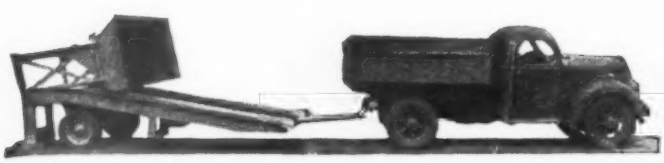

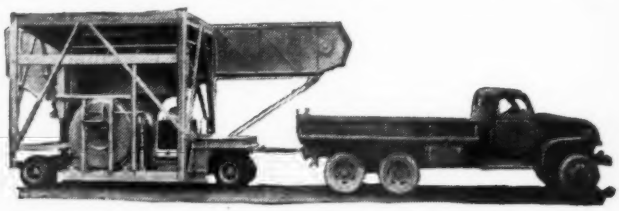

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ERIE GA PORTABLE AGGREMETER PLANTS standardized in 54- 78 or 102 Ton capacities use a specially designed 3-material weighing AggreMeter in 1, 1¼, 1½ and 2 cu. yard capacities. We are producing these plants in quantity and can make good delivery. Booklet GA-1 tells its story—Outline your requirements.

for concrete sand producers . . .

3 FLOWSHEETS *for* 3 CONDITIONS

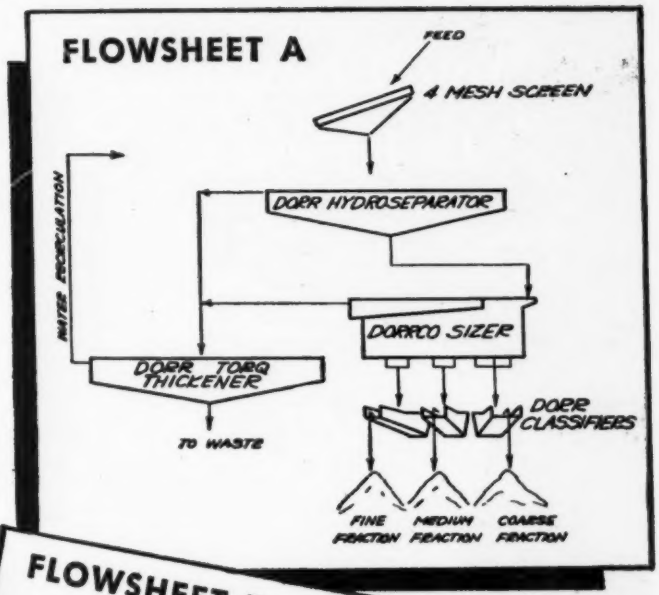
THE three flowsheets at the right are *not* intended as a cure-all for concrete sand producers' problems . . . for each installation must be considered in terms of raw material, method of digging and end product required. They do, however, represent three demonstrated solutions to three existing general conditions . . . and as such are worthy of attention.

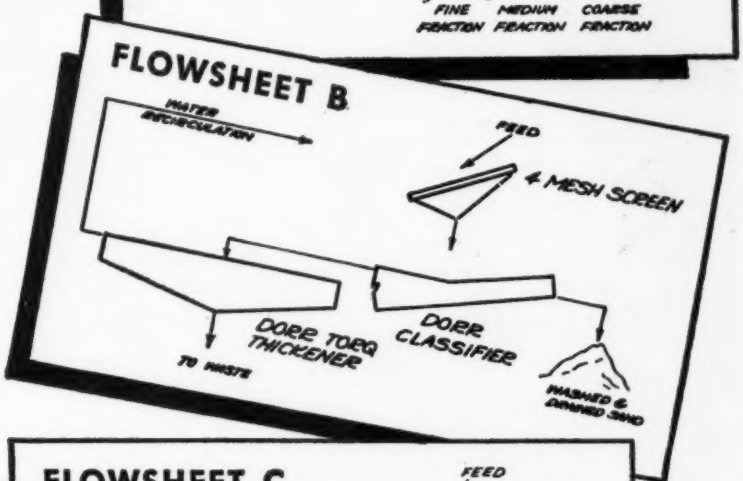
FLOWSHEET A — for specification sand from raw materials containing variable size distribution . . . provides primary dewatering and desilting in a Dorr Hydroseparator, sand fractionation in a Dorrco Sizer, and final dewatering of the several fractions in Dorr Classifiers ahead of blending. Water is recovered for reuse with a Dorr Thickener.

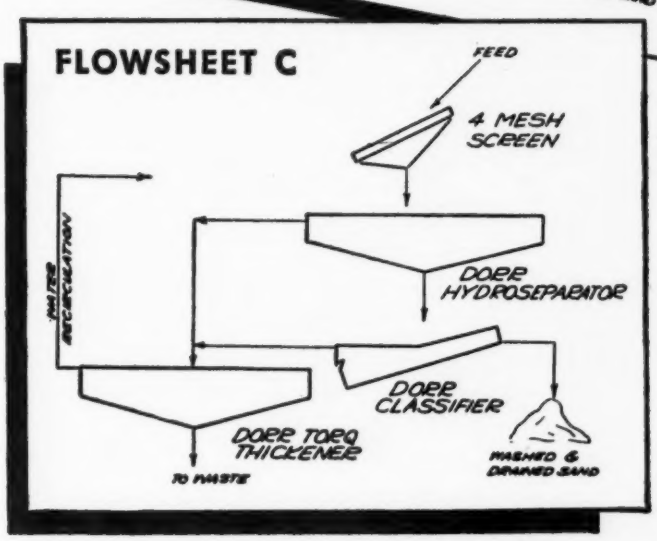
FLOWSHEET B — for a well washed sand from deposits in which there are no serious deficiencies or excesses of certain sizes . . . provides washing and desilting in a Dorr Classifier and water recovery for reuse with a Dorr Thickener.

FLOWSHEET C — for a well washed sand from deposits where size distribution is uniform *but where the feed involves the handling of large volumes of water as in dredge digging* . . . provides for treatment as in Flowsheet B, with the addition of a Dorr Hydroseparator ahead of the Dorr Classifier, for the preliminary dewatering and desilting of the sand.

Regardless of whether you are interested in a simple washing plant for concrete sand, or in the production of a special sand involving fractionation, Dorr equipment plus Dorr engineering can help you produce . . . *at a profit.* A Dorr engineer will gladly discuss the application or modification of any of these flowsheets to your particular problems of production . . . without obligation.







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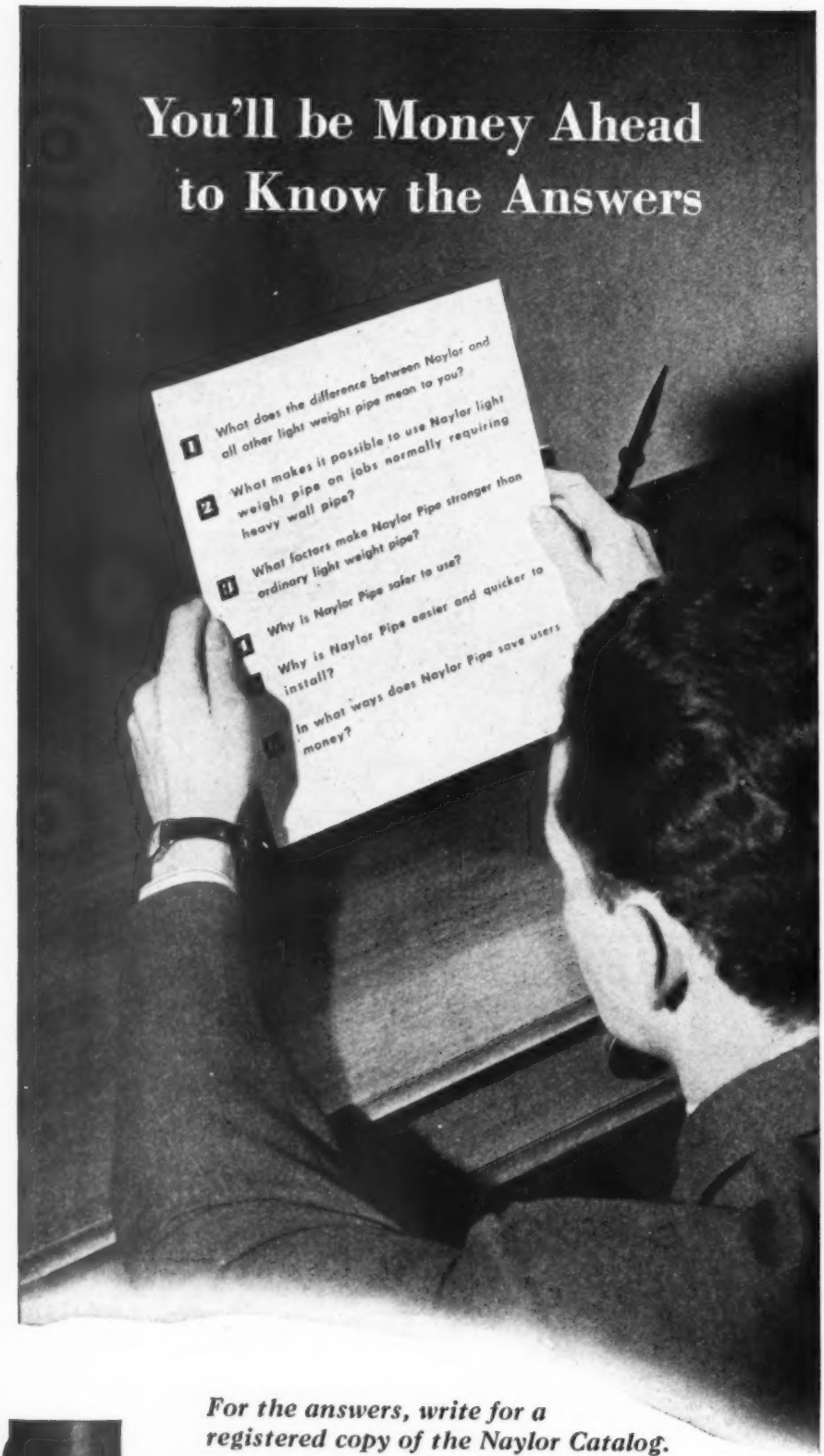
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Soil Conservation

(Continued from page 119)

limestone men stand to lose more than you may think by any shift in type or administration of the soil conservation program. Just look around your own territory and see for yourself; ask your customers, your A.A.A. committeemen, your county agents or anybody who has his finger on the pulse of local agriculture. If the use of ground agricultural limestone would not immediately be cut in half, then their guess is wrong. And in many places not 25 per cent of the distribution would be salvaged. You can't afford the blow, the farmer can't, the nation can't. But it's coming and coming fast if your voices are not raised in support of the program. A.A.A. has no press agents. Even its own information service was taken away from it a few years ago because other agencies had begun to fear its power. And since the President has asked Congress for only two-thirds of the money which A.A.A. has been getting annually, the policy is laid down and A.A.A. employees can't even tell you that they need more than that.

It is easy to see what the stake of you limestone people is in the maintenance of an effective A.A.A. program. I have heard the whole program referred to as the "lime program" in some counties.

New Crushing Plant

(Continued from page 92)

carcass was left at 7 plys, the covers were reduced to ¼-in. top with 3/32-in. back due to the finer material handled.

Conveyors No. 4, 6 and 7 are comparatively short belts generally handling minus 2½-in. material, and the carcass was accordingly made of 5 plys of cord with the cover the same as on conveyor No. 3. All belts were vulcanized endless on pulleys, thus eliminating a major source of belting difficulty.

The Electrical System†

With the "Primary Jaw Crushing Plant" and its 2000-hp. of connected load added to the existing operations, the total connected load was in excess of 5300 hp. The electrical distribution system was already badly overloaded; consequently it was necessary to make additional capacity available in order to serve this load. This dictated a thorough analysis of the plant electrical system with respect to present load, probable load growth due to expansion, and securing the most advantageous energy rate from the local power company.

The total plant connected load, consisting primarily of motors, is distributed as follows: 2250 hp. in the "Main Crushing Plant," 750 hp. in the "Recleaning-Oil Mix Plant," and

†Described by C. V. Roseberry, Westinghouse Electric Corporation.

2000 hp. in the new "Primary Jaw Crushing Plant."

Electrical power for the "Main Crushing Plant" was supplied and metered by the Coast Counties Gas & Electric Company at 480 volts from a transformer bank located across the Southern Pacific Railroad right-of-way. This necessitated a long underground feeder under the Southern Pacific right-of-way with its inherent disadvantages with respect to maintenance and voltage regulation. The "Oil Mix-Recleaning Plant" was supplied 480-volt power from another transformer installation under a separate meter. A rate analysis indicated that these two loads could be combined under one meter with no appreciable increase in the maximum demand rate for the complete plant.

Obviously, the existing electrical distribution system was not adequate, and a thorough study was made to determine the most economical system that would adequately serve all plant facilities and also would be able to handle the expected plant expansion over the next several years.

A second consideration was the incorporation of a suitable grounding system for the electric shovels used in the quarry operations. It is generally recognized that the ground connection offered by shovel treads on a rocky quarry floor are quite inadequate, and present a definite hazard to operating personnel in case of fault or insulation failure of any kind. Company management felt that a suitable grounding system with adequate ground relay protection on all shovel circuits, should be incorporated in the new distribution system.

Distribution Analysis

From the standpoint of voltage regulation, the 480-volt supply was inadequate under the existing plant load. A higher distribution voltage was indicated, but just what voltage to use was a subject of considerable study. Two of the electrical shovels were equipped with 440-volt drives, while the third and largest shovel operated at 2,400 volts. At first, it appeared that a 2400-volt distribution system was the logical solution; however, an analysis of voltage drop and conductor sizes involved indicated that while 2400 volts would handle the present plant facilities, and 2000-hp. addition quite satisfactorily, it would not leave sufficient capacity for expected plant growth. Considering these factors, it was decided to use a primary distribution voltage of 4160 volts, grounded neutral, and step down to 480 and 2400 volts at the various utilization centers.

The public utility supplying the plant with electrical power agreed to bring a 22,000-volt circuit onto the plant property and install adequate transformer capacity to supply and meter the total load at 4160 volts. A location for the utilities company sub-

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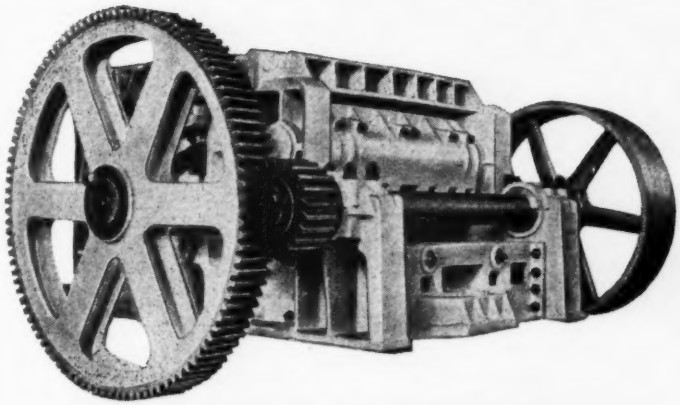
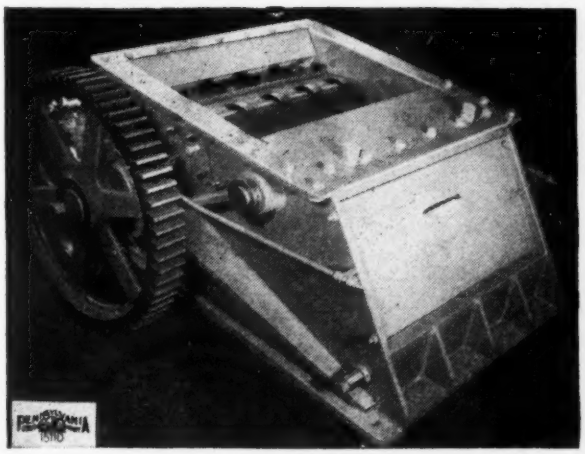


PENN-LEHIGH



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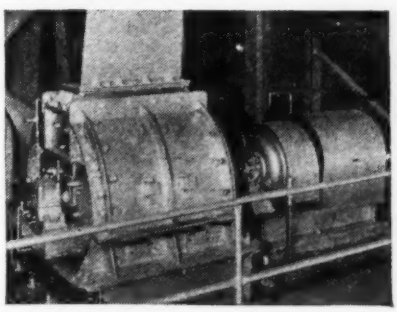

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Alternate right and left-hand operation sharply cuts maintenance cost.

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station site was selected on the 100-ft. level, as near the electrical load center of the plant as possible.

The Granite Rock Company's 4160-volt switch house was located adjacent to the utility sub-station. From this switch house three 4160-volt, 3-phase, 4-wire, feeder circuits were laid out to supply the plant electrical power. These three circuits consisted of: a shovel feeder circuit for the upper level, a feeder to the "Oil Mix-Recleaning Plant," and a third feeder to the "Main Crushing" and "Primary Jaw Crushing Plants." Each circuit was provided with an oil circuit breaker, relays and disconnect switches.

Shovel Power Supply-Safety Precautions

The shovel circuit was designed to supply power to all shovel operations on the upper quarry levels. This entailed a system that would handle both the 2400- and the 440-volt shovels. In order to accomplish this from the 4160-volt supply with adequate ground protection for the shovels, a transformer was located in the shovel circuit adjacent to the switch house, to transform from 4160 volts to 1380/2400 grounded WYE volts. This 1380/2400 volt, 4-wire grounded WYE circuit was then carried on overhead poles through the upper level of the quarry with high voltage plugs providing shovel cable connections at convenient locations along the line. To supply power to the 440-volt shovels, a portable transformer and grounding resistor, circuit breaker combination, mounted on skids, will be used off this circuit.

For the shovel operations at the lower quarry level, a similar transformer is provided and energized from the "Main Crushing Plant" feeder circuit at the primary crushing plant site.

The shovel impedance grounding system provides a high degree of protection against the hazards of dangerous voltages appearing between the shovel and ground, in case of a ground fault on the system. This is obtained by:

(a) Providing connections at lowest practicable impedance between the shovel frame and ground.

(b) Limiting the ground fault current to such a value that the potential rise of the shovel frame above ground, due to the voltage drop in the grounding circuit, will not exceed a voltage which ordinarily is not considered dangerous to human lives.

(c) Disconnecting the faulted feeder circuit as quickly as practicable when this voltage appears.

The grounding system provides these essentials: first, by connecting the frames of all shovels and other mobile equipment supplied from the main distribution lines, through a ground wire, to the sub-station ground, and with sufficient number of ground connections to lower the impedance to ground to 5 ohms or less; second, a resistor was connected

between the sub-station ground and the transformer neutral to limit the ground current to a predetermined value so that, in case of a ground fault, the voltage drop in the ground circuit would not cause a dangerous rise in potential above ground of the wire or the frame of any equipment connected to it; third, the installation of a current transformer and sensitive relay in the lead between the transformer neutral and ground, was arranged to trip the shovel feeder circuit breaker with a short time delay, in case of a ground fault occurring on the system. This scheme of protection is believed to be the most positive and practicable yet developed for safeguarding operating personnel from the hazards under discussion.

Plant Layout

Existing plants and the new plant addition are located along the Southern Pacific Railroad Co. right-of-way for approximately 1800 ft. The "Main Crushing Plant" load is made up of the Regrind Plant, the No. 7½ Plant, and the Resizing and Washing Plant which are all located on the Southern Pacific track level. A Meade-Morrison 200-hp. rock car hoist is located adjacent on the 100-ft. quarry level. Next is the No. 8 Plant and the new Primary Jaw Crushing Plant.

A bank of six 100 kva. transformers, located on the 100-foot level supplies the Regrind, the No. 7½, the Resizing and the Washing Plants, as well as the Meade-Morrison car hoist.

The No. 8 Plant is fed from three 250 kva. transformers which are located at the 50-ft. level.

Sequence Control

The electrical system of the new Primary Jaw Crushing Plant is outstanding in that it incorporates fully automatic sequence control for all operations. The system is so designed that all plant operations, crusher, conveyors, screens, etc., are controlled from one central location. Facilities are provided for the automatic routing of material over the various combinations of conveyors to deliver it to the desired location, whether these be the carloading bunkers, the truck bunker or to the re-crushing plants. This is accomplished by presetting the conveyor sequence transfer switches for the combination desired and then pressing the master start button which automatically starts the various conveyors, screens, etc., in their proper sequence, to deliver the material as required. This is all handled by one operator at the main control desk, located adjacent to the jaw crusher. He can also regulate the speed of the 9-ft. apron feeder thereby changing the rate of flow of quarry run material to the bar grizzly, or, he can change the speed of the 42-in. pan feeder, etc., removing material from the hopper under this grizzly.

[Further details covering the Electrical System will appear in the next issue. The EDITOR.]

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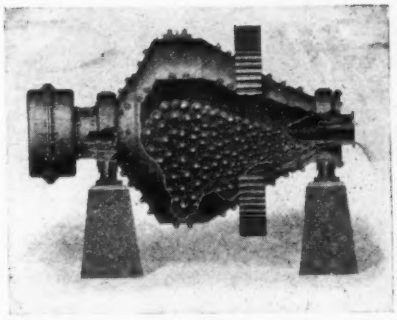
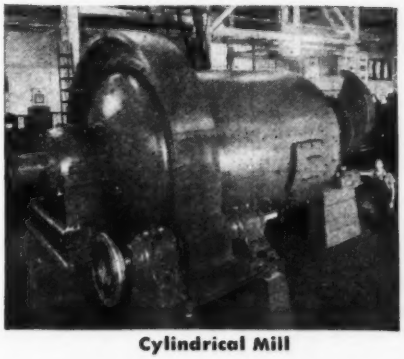
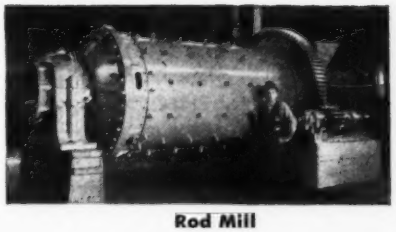


Conical Mill



Cylindrical Mill



Rod Mill

Tube Mill

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No matter what your grinding problem . . . HARDINGE has a mill to do the job. And . . . forty years of experience in mill work stand behind every Hardinge product.

★ **Conical Mills**

The Hardinge Conical Ball (or Pebble) Mill is unequaled in efficiency. Grinds wet or dry, in open or closed circuit. Outstanding feature: natural size-segregation of grinding media, from feed to discharge. Bulletin 13-D.

★ **Cylindrical Mills**

The Cylindrical Ball (or Pebble) Mills have demountable trunnions and convex heads to reduce head liner wear and increase mixing action. Supplied with or without grates, as required.

★ **Rod Mills**

Ideal for producing minimum oversize in an open grinding circuit. Grinds either wet or dry. Conical heads reduce friction—prevent congestion of charge at the ends. Rods are self-aligning. Bulletin 25-B.

★ **Tube Mills**

Particularly recommended for producing finished product in open circuit without classifying equipment. Convex heads; grinding media — pebbles, balls, or product material itself. Bulletin 18-A.

★ **Batch Mills**

Designed for wet or dry batch grinding, as opposed to continuous grinding. Excellent for pulverizing and mixing small quantities of material or special products. Bulletin 19-A.

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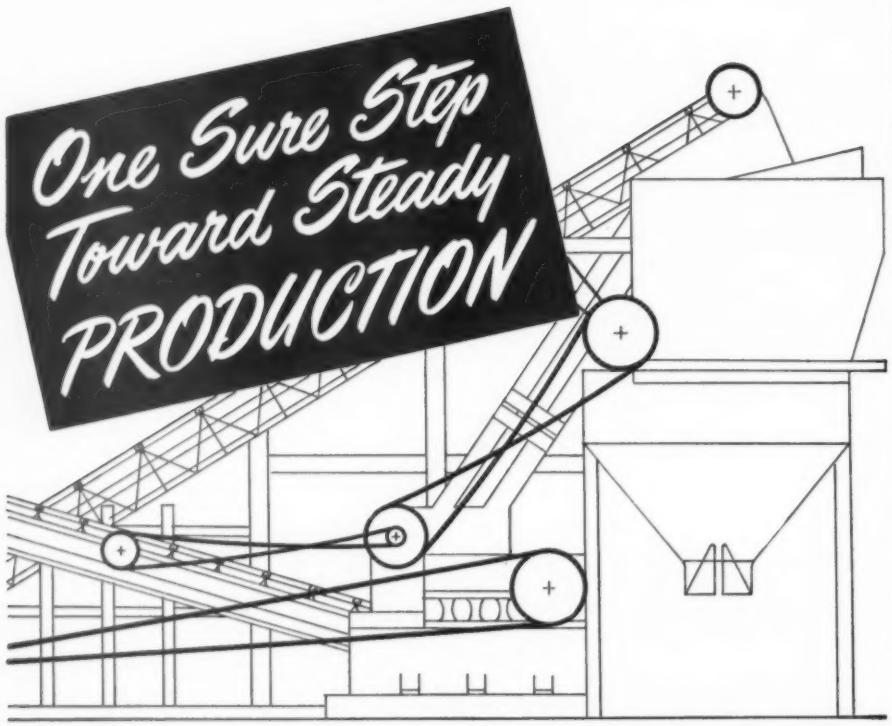
SAN FRANCISCO 5—94 Natoma St. • 200 Bay St.—TORONTO 1



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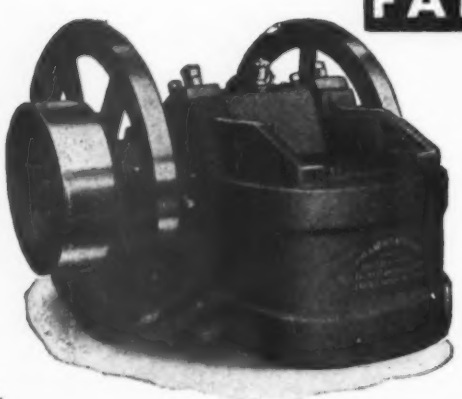

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Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service

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Agstone's Future

(Continued from page 110)

as our dealers contact these farmers frequently. Our dealers are not large operators in the majority of cases but handle a relatively small tonnage so that they can give their personal attention to their farmer customers."

Also from Ohio: "Where an aggressive dealer organization did not exist and where truckers only handle USDA orders the decline would be sharp. No doubt much more vigorous advertising and promotional efforts would be necessary to maintain the present high volume of orders without contracts or purchase orders."

On the general subject of purchasing agricultural limestone, the following informative letters are reproduced, in part:

From Pennsylvania: ". . . there has constantly been available to farmers the choice of purchasing materials and obtaining reimbursement therefor upon application. Farmers are also permitted to make assignment of such sums as they may be entitled to receive under the Agricultural Adjustment and Soil Conservation and Domestic Allotment Acts to dealers, manufacturers and others who supply the services and materials embraced in soil use and conservation programs.

"The principal objection to acceptance of assignments is that farmers tend to demand delivery in the planting seasons. Development of such a trend would reduce the manufacturing period and increase costs which, if passed on to consumers, would lessen market potentials; and if not, cut into already modest profits of producers.

"Assignments are not paid until the program year is closed and conservation practices are checked and certified. Any indebtedness of a farmer recorded on the 'registry of indebtedness' is deducted against any credits due for carrying out conservation practices. The numerous ways in which such indebtedness may occur, and the lack of access to the registry, create uncertainties which exceed those a prudent person might choose to accept.

"During one year when the undersigned was short government orders, use was made of assignment procedure. This experience resulted in loss on only one account, but did substantially increase operating costs.

General Comments

From Iowa: "It is my opinion that all classes and associations should be more concerned today with our national debt and taxes than to urge continuously greater spending on the part of our federal government. It is true in my opinion that considerable less limestone would be sold and used if the farmer were to buy it himself but I also believe that the industry could do and should be ex-

pected to sell the limestone because it has been proven that it is essential, very productive and a sound investment and the farmer is well able to pay his own and for those who have not the ready cash, the Federal Reserve Banks and local banks are in position and I believe willing to make the cash available. As far as our own and other well established concerns are concerned, I believe we can produce and sell without government aid and interference. It would no doubt affect many of the fly-by-nights and local roadside quarries which developed under the guidance and tutorship of the triple A and like agencies."

Also from Iowa: "During the years 1940, 1941, and 1942 we used weekly newspapers in small towns in territory we could serve from our plant; we used from six to fifteen different papers to advertise in and ran ads at least twice a month in each of them.

"Since early in 1942 we have not done as much advertising as we previously did. The demand created by advertising and the government allowance received for liming, created such a demand that we have been able to sell all of this material we could produce.

From Wisconsin: "We believe the limestone industry would be benefited greatly if each contractor furnishing material would have to furnish a performance bond, large enough to force them to complete any contract they take or else not allow them to bid in that county any more. We are very discouraged because of the contract letting setup. Small one-horse outfits go into our counties and bid very low. It is always a bid at a price lower than what we bid and lower than a figure at which they can continue to produce limestone at a profit. About September or October of that year they go out of business and the county A.A.A. committee wants us to finish the contract. We have decided to let the counties sit this year with the companies they have awarded the contracts to, as we are through finishing deliveries. We ran into this trouble from 1939 to 1944. During 1945 and 1946 we were not troubled. However, the same condition exists again this year."

The minority, who oppose the continuance of the soil conservation program, unquestionably do have a sound philosophy, in that federal spending should be curtailed wherever possible so that taxes may be correspondingly reduced. There are far too many people employed in government and too many large expenditure activities for a long-range healthy economy. But, the agricultural limestone industry as a whole, scientists, in soil technology and others vitally interested in agriculture and the public welfare believe that the educational campaign instituted by the A.A.A. in 1936 is far from complete. While the A.A.A. has convinced a great number of farmers of the value accruing to them

4 IMPORTANT FACTORS IN THE MAKING OF THERMALLOY CASTINGS

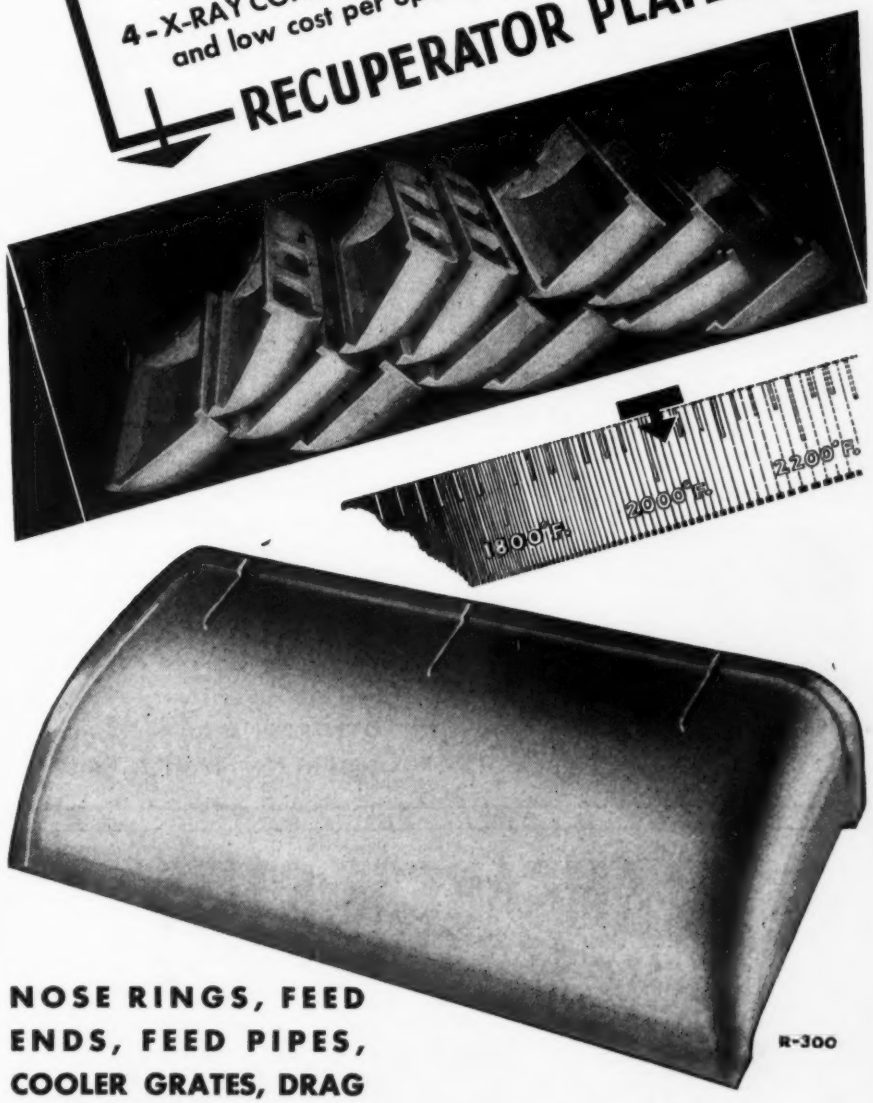
1 - Excessive weight eliminated—Points of stress concentration are minimized.

2 - Our engineering department is ready to help you design or redesign your kiln alloy installation to avoid cracking, reduce wear and increase strength.

3 - SOUND FOUNDRY PRACTICE and expert craftsmanship, guided by our Research laboratory and Experimental Foundry, is essential to sound castings.

4 - X-RAY CONTROL furthers the assurance of long service life and low cost per operating hour THERMALLOY castings.

RECUPERATOR PLATES



R-300

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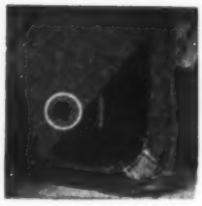
3600 powerful, controlled vibrations per minute break down arching and plugging of sand, gravel, aggregate, cement, lime, gypsum, rock, and other materials.

Eliminate damage from pounding and sledging—and employee hazards.



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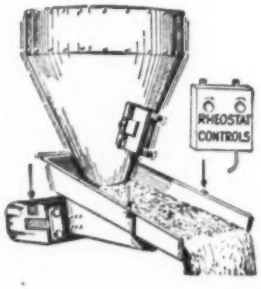

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Smooth, effortless flow of bulk materials—from fine powders to coarse ores and rock—dry or damp—hot or cold—instantly controllable by turning the rheostat.

Available in a variety of sizes and styles with capacities to 500 tons per hour.

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Established 1881 CARLISLE, PA.

from liming and the application of other soil conservation practices, it is very strongly felt that it would be a serious mistake should soil conservation payments be curtailed at this time. The record does reveal that 90.8 per cent of the total usage of liming materials in 1945 came under the Agricultural Conservation Program, which does not bear out suggestions that the logical first decrease to conform with the Truman recommendation for reduction in funds should be in the allocation for liming materials because, as alleged, that activity has had the greatest acceptance of all soil conservation practices.

There is little question that the companies with long established sales and dealer organizations would fare better than those that have depended almost entirely on the government program to build their sales volume.

Agricultural Limestone Associations

There apparently is little question among producers of agricultural limestone that the Agricultural Limestone Division, National Crushed Stone Association, and the National Agricultural Limestone Association should join forces into one organization to serve the industry. That was the unqualified expression of the industry (including members of both Associations) in reply to our request for suggestions as to how to affect that end, which the two Associations have admitted as desirable in furthering the best interests of the industry.

Both organizations are actively operating for the benefit of their memberships, the main difference, as we see it, being that the Agricultural Limestone Division, is endeavoring to a large extent to work directly with the farmers through the various agencies which reach them to stress emphatically the value of liming. This Division is emphasizing sales promotion on the theory of building business for the future regardless of the trends that might come in government financing. The majority of both memberships believes that continued federal aid is necessary for continuance of an adequate liming program.

There is no question but that the agricultural limestone industry has grown to sufficient size, according to several correspondents, to support easily an effective organization at relatively low cost per member. Those who are members of the National Agricultural Limestone Association insist that the industry have an entity of its own, because, as they point out, problems and conditions in manufacturing, merchandising and distribution pertinent to that industry alone exist. They cite the fact that many concerns are 100 per cent engaged in the production of agricultural limestone which is correct but, on the other hand, many producers of commercial crushed stone have become very important producers of specification agricultural limestone.

Legislation

(Continued from page 102)

it supplied materials for the building of roads or railroads.

The Wage-Hour Act, however, is on the books, said Mr. Horsky, and will be an expanding piece of legislation, the Courts coming to the point where practically the entire United States economy is being absorbed under the Act. For instance, he said, in the McCready Construction Case (1946), the Court held that employes engaged in building new streets, buildings, etc., were covered. Such construction was ruled as being extension of and additions to existing facilities and as not being really new, and that the projects would soon result in interstate commerce movement.

Mr. Horsky stressed the importance of rulings such as this, since suppliers easily could be considered as coming under the Act if the builders who use their materials are ruled under the Act.

Another means to extend coverage of the Act is the phrase of coverage, "Operations necessary to the production of goods for commerce," which, said Mr. Horsky, could be applied to anything necessary to something else. He mentioned the Amaton decision, in Denver, involving industrial sand. It was ruled in that case that the sand, supplied to a steel foundry in the same state, was necessary to the production of the castings and it was held that the employes in the production of the sand were covered by the Act. Mr. Horsky cautioned the industry to be aware of the risks being taken, if not operating under the Act, in the light of this trend in judicial decisions.

Mr. Horsky then considered developments in the computation of overtime when bonus arrangements or incentive pay plans are in effect. Even bonus payments, if made regularly and the employes come to expect it although not entitled to sue for it have been ruled in recent Court decisions as necessary for accounting in the computation of overtime compensation.

He also took up the matter of executive employes and administrative employes, which the Act exempt. There are six specific requirements, *each* of which must be met before a man can qualify as an executive employe, he reminded. Such a man must be generally concerned with management, have the power to hire and fire on his effective recommendation, must supervise employes, must be paid at least $30 per week, must spend not more than 20 per cent of his time doing non-executive work and have the power to exercise judgment and discretion. Each of those tests must be met.

In concluding, Mr. Horsky stressed that, whichever of the two bills is adopted, it may be very important that an employer determine in his collective bargaining contract exactly what he will and will not pay.

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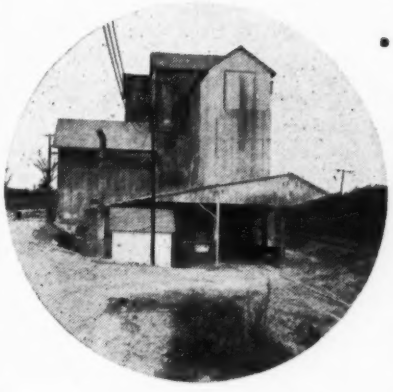
...for 9 Years



The 4′ x 6′ double-deck Plat-O Vibrating Screen, operated by the Cerulean Stone Company, Cerulean, Ky., has been doing a superior screening job for nine years. While the screen has handled commercial gravel of all kinds during this period, the only repairs have been on the ½″ and ⅜″ screen cloth, and the replacement of one bearing.

The rugged design and construction that assures minimum maintenance throughout long service life is only one of many reasons why Deister Machine Company products are popular with stone and aggregates producers. Proved dependability, faster grading, and more accurate sizing have made Plat-O tops with operators all over the world. Write for details on the Plat-O Vibrating Screens.

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Plants: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles

Plants handling Cement, Lime, Gypsum, Sand, Gravel, Crushed Stone, etc., use the WEIGHTOMETER for fast, accurate production.

WEIGHTOMETER gives a continuous, automatic, and accurate weight record of materials in transit at an extremely low operating cost. All producers of bulk materials handled by belt conveyors need this dependable check on production figures supplied by MERRICK WEIGHTOMETER.

Merrick Scale Mfg. Co.
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Durability of Concrete

(Continued from page 104)

matrix in andesitic rock inclusions in an otherwise non-reactive aggregate was contributory to concrete failures that led to the conclusion that it is unsafe to use San Joaquin river aggregates except with a low alkali cement.

The studies described by Mr. Stanton led to definite conclusions: First, he said that certain mineral constituents in aggregates contribute to expansion of concrete and sometimes to stresses sufficient to cause failure. Secondly, some shales expand excessively, which is a physical action of much less intensity than the chemical reaction he had discussed. Thirdly, the chemical reaction always takes place with the opal-bearing cherts and shales (in the failures studied) or with some of the andesites and other volcanic rocks of the Sierra Nevadas and are probably due to a volcanic glass matrix readily dissolved by an alkali solution.

Fourthly, the chemical reaction producing excessive expansion occurs only when the portland cement contains an appreciable percentage of alkali in the form of sodium and potassium oxides or the aggregate contains a high percentage of alkali to supplement the alkali in a low alkali cement. The intensity is usually negligible when the alkali content is less than 0.6 per cent. And finally, the solution of the problem of concrete durability under conditions which have caused trouble in California is the use of a low alkali cement with the greatest practicable reduction in the percentage of the rock types known to be contributory agents.

New Markets for Sand and Gravel

BEFORE a session of the National Sand and Gravel Association concerned with markets, HARRY D. JUMPER, engineer, Consolidated Rock Products Co., Los Angeles, presented a paper, "Use of Industrial Products for Granular Bases in Highway Construction" describing possible outlets for rock dust and other plant by-products which otherwise might be waste materials around the plant. He said the first realization of the stability of granular materials for roadways came from their use for service roads in and about the plants in California. Soon after, methods were developed for evaluating materials to be used for base or sub-base materials under pavement slabs. The study resulted in the adoption of the bearing value, and the expansion or swell test. These tests are for the purpose of determining resistance to displacement under moist or wet conditions, and the volume increase resulting from absorption of moisture. He pointed out that, in his opinion, it was better to use physical property tests of combined materials rather than the minus 40-mesh particles.

In describing the method of testing, Mr. Jumper said that all sizes including sand and stone particles up to ¾-in. were used. It was pointed out on a graph that crushed gravel bases which are well graded from coarse to fine and having approximately 50 per cent passing a No. 4 sieve gave bearing ratio values exceeding 80 per cent of standard, also that well graded gravels having a like amount of sand gravel bearing ratio values which exceed 50 per cent of standard. In the case of the gravel and sand bases, stability may be materially increased by substituting 15 to 20 per cent of crusher dust (minus No. 4 sieve) for an equal amount of sand.

He compared bases made up of decomposed granite (high in silt and clay) with granular bases as prepared by the sand and gravel industry. The former, when tested dry, gave a higher value than the pit run sand and gravel, but when the decomposed granite was tested after 4 days soaking gave much lower values, while the granular bases manufactured by the industry gave much higher values. He attributed this to particle interference and the resistance to flow due to lack of surface lubrication.

Manufacture of granular bases was described. He pointed out that where bases are used the tonnage requirements are large and deliveries must be fast, so maintenance of a suitable stockpile was advocated. A present practice is to load stockpile trucks with 50 per cent crusher dust and 50 per cent crushed gravel having top sizes of 1- to 1½-in. These are dumped at the stockpile site and piled up with yard cranes, thus mixing the materials. Other methods were also described.

The discussion following Mr. Jumper's talk brought out the point that 4 to 5 per cent of minus 100-mesh material built up the bearing values in most cases. JOHN E. PORTER told of airbases in California that used up to 66 in. of base materials where large airplanes exerted weights up to 75 tons per wheel. STANTON WALKER asked about permeability and durability phases and it was brought out that minus 200-mesh materials should be absent if the base was in a cold climate. E. K. DAVISON, Pittsburgh, Penn., asked if the material "rolled" when first spread and subjected to the conventional road rollers. The answer was in the negative provided the materials were damp or wet when placed but if some clay was in the mix, water was not always needed. R. V. WARREN, Pittsburgh, Penn., brought out the point that where the top size was 1½ in. an off-balanced amount of ½-in. material improved the load bearing qualities.

A paper by Ezra C. Knowlton, Utah Sand and Gravel Co., Salt Lake City, Utah, dealing with "Practices of Western States in Using Sand and

Gravel in Bituminous Mixtures," was presented before the National Sand and Gravel Association. The speaker first described the western states as those west of a line drawn through the eastern boundries of New Mexico, Colorado, Wyoming and Montana. Texas was also included in the group as conditions there are similar to the other states included. This area comprises 47 per cent of the total area of the U. S. It has 22 per cent of the public roads mileage and only 15.4 per cent of the population, over half the people living in the States bordering the Pacific ocean. Financing roads in such vast areas of small population required that the road engineers use considerable ingenuity in perfecting construction methods so that local materials could be used. The low cost bituminous road supplied much of the mileage with the funds available.

Bituminous surface treated less than 1-in. thick,

Low cost bituminous road mix,

Low cost bituminous plant mix,

Bituminous penetration or macadam, 1-in. or more thick,

Bituminous or asphaltic concrete,

Sheet asphalt.

The questions asked were related to mileages of each type; specifications relating to the use of crushed rock, gravel, or crushed gravel; screen grading requirements; whether or not specified amounts of crushed particles were based on stability requirements. Also it was asked if the plan of blending small amounts of high quality material with local aggregates had been used to meet stability requirements.

The answers to these questionnaires were shown in a tabulation. It was pointed out that these 12 States have a total mileage of 75,325, of which 10,537 miles are concrete, 23,263 are bituminous surface-treated with less than 1-in., 30,652 miles are low cost bituminous of the two methods (road mix and plant mix), 4,519 miles are bituminous penetration more than 1-in. thick, 5,953 miles are bituminous or asphaltic concrete and 401 miles are sheet asphalt. The figures showed that in the western States 72 per cent of the total road mileage falls in the first three groups of low cost bituminous material, or 53,915 miles. A survey of the data led the speaker to summarize that 80 per cent or 64,788 miles of bituminous paving of all types was built of gravels where in the specifications required no set amount of crushed particles. However, those States bordering the Pacific ocean do specify certain amounts of crushed material.

In summarizing the answers to the fourth question, as to whether specified amounts of crushed particles were based on stability requirements, two affirmative replies were received and these only for some of the mixes. The answer to the question as to whether small amounts of high quality material had been blended with local aggregates was negative.

Get **HIGHER** *tonnage* at **LESS** *cost...*

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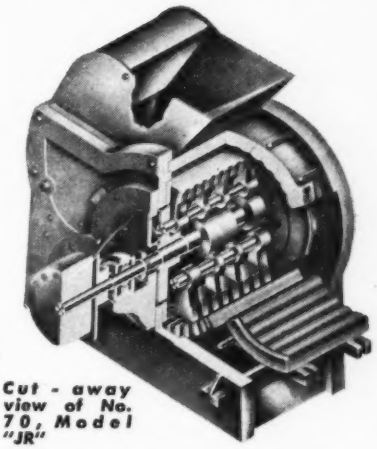
DAY *Swing Hammer*

Pulverizer-Crusher



Cut-away view of No. 70, Model "JR"

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EASY ACCESS — QUICK ADJUSTMENTS

STURDY, LONG-LIFE CONSTRUCTION

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EXTRA STEP-OUT HOLES FOR WEAR
MANGANESE STEEL SIDE LINERS
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● All over America operators of the DAY Pulverizer-Crusher say that its heavy duty and high tonnage make it the most economical and practical machine they have ever used. It can serve either as a pulverizer or as a crusher and can reduce man-size stone to road rock or to agstone fineness in one operation.

● Three extra-heavy manganese steel hammers of the one piece U-shape type are used. Because of their massiveness and superior weight these individual swing hammers give a far greater striking force than a series of small hammers, thereby producing greater capacity at less cost. DAY Pulverizer-Crushers are built in 5 sizes—from 1 to 75 tons per hour capacity. Made by Brooks Equipment & Mfg. Co., manufacturers of the famous Brooks Load Lugger and other quarry and materials handling equipment.

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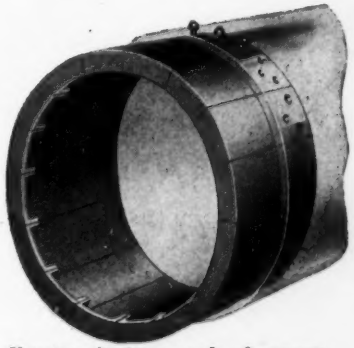
have been installed in cement kilns over a period of 14 years, without one failure recorded. This is definite proof of the ability of PYRASTEEL kiln ends to avoid costly burn-outs, and give years of continuous service.

In other high-temperature applications, PYRASTEEL has no equal in assuring uninterrupted, high-economy operation when used for making conveyor screws, drag chains, feed pipes and clinker coolers.



Showing discharge end of cement kiln fitted with PYRASTEEL Segmental Kiln Ends.

Unit segments are easy to install or replace.

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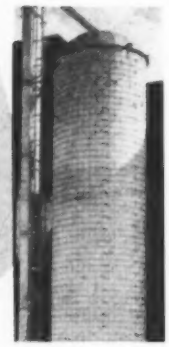

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Neff & Fry staves are dense, smooth, enduring They interlock to form strong, tight joints. Each tier is bound with high-tension steel hoops. The result is a substantial structure which serves for a generation with virtually no upkeep cost

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If you have a storage problem or project, be sure to obtain complete information from us. You won't be high-pressured, for we have enough business without employing such tactics.

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CAMDEN, OHIO

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CONSTRUCTION IN 1947

A VERY INFORMATIVE ANALYSIS of the construction prospects for 1947 and the factors that will influence volume was presented by Thomas S. Holden, president, F. W. Dodge Corp., New York, N. Y., speaking before one of the joint sessions of the National Sand and Gravel Association and the National Ready Mixed Concrete Association. The general tone of Mr. Holden's paper was very optimistic even though, as he pointed out, the stabilization of industrial labor relations without serious work stoppages and strikes, and the stabilization of commodity prices without a sizeable business recession are the two major problems that will govern.

The construction materials market has been moving toward a supply-requirements balance ever since the middle of 1946, he said, citing Department of Commerce indices on production of construction materials to show the trend. A forecast of the 1947 material supply situation by the C.P.A. has estimated requirements for an over-all nationwide construction program of $19,300,000,000. Portland cement and concrete block supply have been estimated at more than 110 per cent of 1947 requirements, gypsum board and lath among those items between 105 per cent and 110 per cent of requirements and only two plumber's items remain short of needs and very slightly so. Freight car shortages, however, may be a deterrent to smooth functioning of material markets.

The government's over-all 1947 estimate of $19,300,000,000 included $13,300,000,000 for new construction and $6,000,000,000 for maintenance and repairs, on the basis of work in place, representing a dollar volume of new construction 24 per cent over 1946. This conforms to the percentage increase estimated by Dodge independently.

Continued improvement in the material supply situation should justify further liberalization of non-residential construction at an early date, over the permitted $50,000,000 weekly now in effect, in Mr. Holden's opinion.

The price situation for building materials has reached a critical stage, he said, having shown an increase, according to Bureau of Labor Statistics indices, from 140.0 to 170.6 in three months since price control removal February 8. The price level of 88 per cent over the 1939 average, in his opinion, is too high to stand up under buying resistance and competitive selling conditions. The sooner reasonable price reductions are attained the better will be the construction industry's prospect for continuous recovery, said Mr. Holden, who believes there will be an orderly stabilization of material prices and that we are in the middle of the process now.

Barring a general deflation, he does not believe that hourly wage scales for construction labor will come down. He advocates a universal eight hour day in all construction trades for the duration of construction shortages as an aid to the stabilization of construction costs

As to the attitude of builders, he said that some builders have begun to tender lump-sum bids while others are advising their clients to wait in anticipation of a 20 per cent reduction in construction costs which, Mr. Holden believes, will come within 12 months or sooner.

Basic reason for cutbacks in all classes of construction between May and December, 1946, was the material supply situation and, he said, the rate of starting new projects in March, April and May of last year could not be maintained. A January upturn followed.

Expansion programs of commercial and industrial organizations have nowhere near run their course, in fact few of them have been completed and some important ones have barely started. Mr. Holden believes that odds are against a severe commodity price deflation which, of course, could bring about a recession in these classes of building.

In the 1947 Dodge estimates prepared in November, 1946, a 10 per cent increase in dollar volume of commercial building contracts and a 14 per cent decrease in dollar volume of manufacturing buildings was predicted. The predicted decline in the latter classification was predicated on the assumption of a decline in commodity prices sufficient to influence adversely the decisions of industrialists and financiers.

Dodge has estimated for 1947 a 35 per cent increase over 1946 in new dwelling units and a somewhat larger dollar volume increase. Apartment building, a most urgent need, is hampered by rent ceilings.

With regard to public building and engineering work, the limiting considerations are high costs, governmental budget limitations and competition for materials and manpower with urgent private work. However, said Mr. Holden, it is now well understood that public and private work should go ahead in a reasonably balanced program since adequate community facilities are essential to new private developments.

Mr. Holden has estimated for 1947 a 48 per cent increase over 1946 in dollar volume of public and institutional buildings, and a 22 per cent increase in dollar volume of heavy engineering construction.

In concluding, he said that we may assume that most of the confusions of transition from war to peace are behind us and that trends toward long-range construction industry recovery are taking definite shape.

*Presented before recent National Sand and Gravel Association convention.

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The Jones organization has an extensive file of information on skip hoist drive problems and will be pleased to work with you on any problems involving such applications

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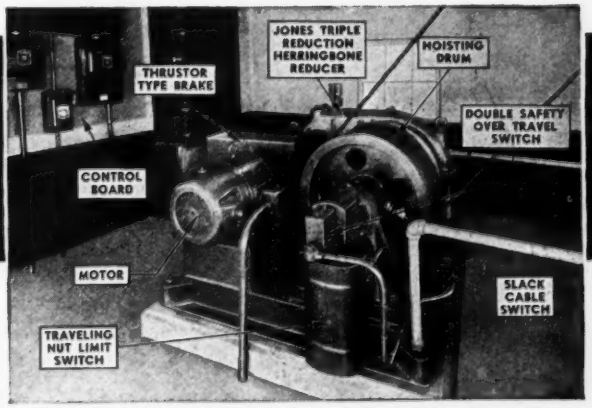
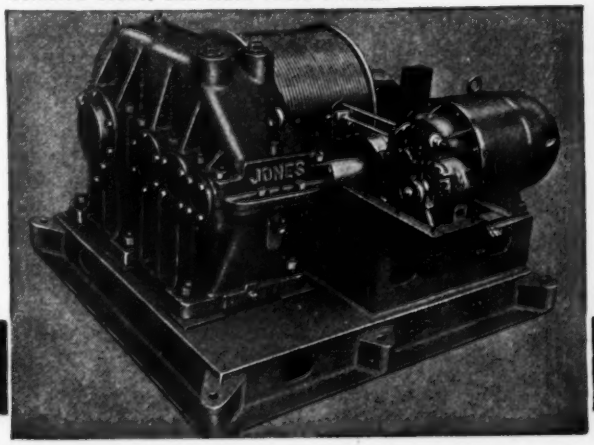


• The view above shows a typical Jones Skip Hoist Drive installation while the view below shows one of the Jones units equipped with traveling nut type limit switch, motor actuated brake, and slack cable switch.



This 2½ cu. yd. Sauerman Power Scraper cuts deeply into hill of gravel and moves about 85 cu. yd. of material an hour to crusher. The scraper tail-block is attached to a movable A-frame located on the brow of the hill.

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Manufacturers' News

Hardinge Co., Inc., Chicago, Ill., announces that Harlowe Hardinge, president of the company, has been elected president of the Manufacturers' Association of York, Penn.

R. G. LeTourneau, Inc., Peoria, Ill., has announced the formation of a Tournalayer sales division with headquarters in Longview, Texas. Richard L. LeTourneau will be manager of the new division.

Harnischfeger Corp., Milwaukee, Wis., has announced the appointment of Ralph D. Holcomb as general sales manager. He will direct the sales of all P&H products, excavators, road machinery, hoists, cranes and welding equipment. Mr. Holcomb's elevation to his new post follows 18 years of continuous service with the P&H organization in Wisconsin, New York, Pennsylvania, Missouri, Tennessee, and California, his latest position being that of district manager for the San Francisco territory. Mr. Holcomb also served as sales manager of the company's large excavator division from 1940 until 1942.

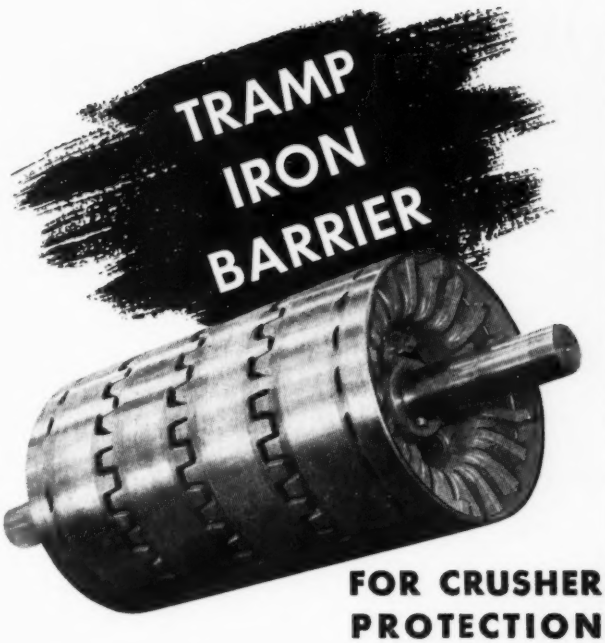
Ralph D. Holcomb

Gar Wood Industries, Inc., Detroit, Mich., has announced the appointment of E. B. Hill as director of factory sales. He was formerly district manager of the general line with headquarters in Chicago, Ill. In his new post he will supervise all factory sales activities, including those of the Buckeye Traction Ditcher and St. Paul hydraulic hoist divisions. Mr. Hill joined the company in 1925 as a shop worker and soon became a salesman in Detroit, transferring to Los Angeles two years later. In 1929, he was made branch manager in Seattle and in 1931 assisted in the sale of the Seattle and Portland branches to the Isaacson Iron Works Co., becoming affiliated with that organization for a short time. Mr. Hill returned to Gar Wood late in 1932 as assistant sales manager of the hoist and body division.

E. B. Hill

American Hoist & Derrick Co., St. Paul, Minn., has announced the election of the following officers and directors: Frederic Crosby, chairman of board and executive committee; Harold O. Washburn, president; Stanley M. Hunter, vice-president of sales;

(Continued on page 154)



FOR CRUSHER PROTECTION

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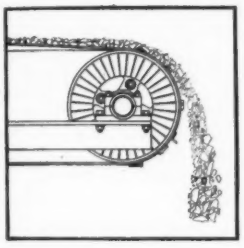
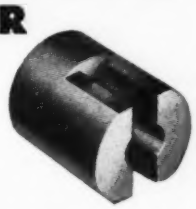


How it works...

Diagram at left shows how Dings Magnetic Pulley, installed as conveyor belt drive pulley, catches iron in material on belt, holds it to pulley face and discharges on underside, away from normal trajectory of non-magnetic material.

Powerful, automatic magnetic separation with Dings Magnetic Pulleys gives your crushers, mills and screens real protection against tramp iron damage. Dings Pulleys are designed for continuous operation at full magnetic strength. Non-magnetic bronze coil covers and end rings do not short circuit magnetic field; and air-cooled design provides forced air flow for cool running under heaviest load conditions. One piece of tramp iron in the wrong place can cost you many times as much as Dings Pulley protection ... *Stop tramp iron before it stops your plant!* Write for Dings Pulley Catalog No. 260 today.

DINGS MAGNETIC ROCK DRILL EXTRACTOR



Here's a new low-cost way to remove drill bits and broken drill rods from drill holes. Dings Drill Extractor lifts 25 to 40 times its own weight... can be carried in a pocket... put to work in a few seconds. Write for price and specification sheet.

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4773 W. McGeogh Avenue • Milwaukee 14, Wis.

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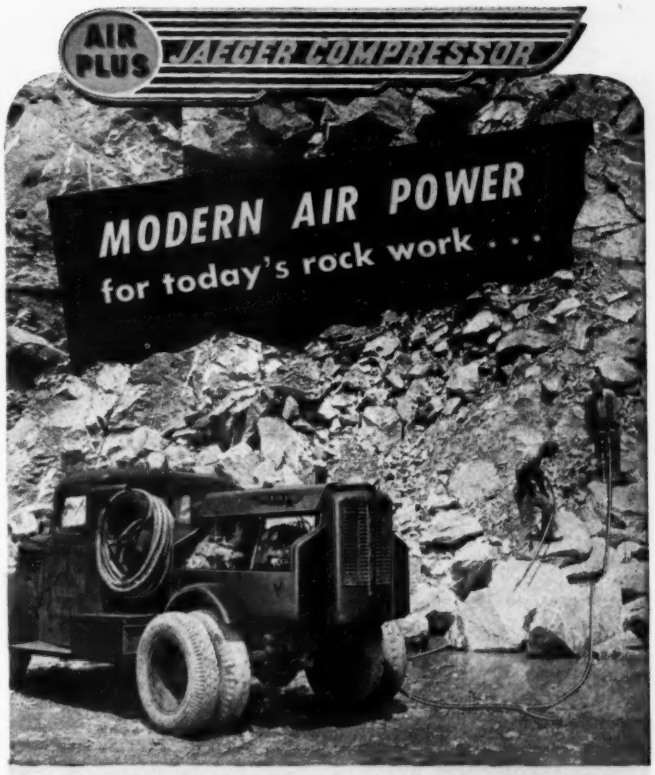

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Established 1857

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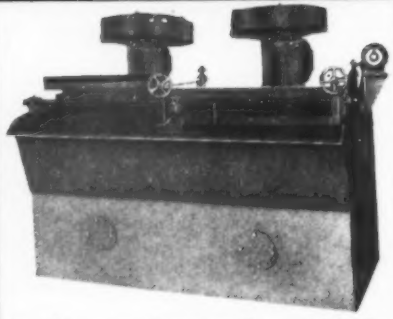
BASIC IMPROVEMENTS IN FLOTATION



In the new Massco-Fahrenwald Flotation Machine air and pulp are introduced separately instead of together. Advantages gained: (1) Greatly increased aeration; (2) More air per unit of power input; (3) Better diffusion and more uniform distribution of air; (4) Remarkable ability to increase aeration with feed overloads; (5) Higher rate of recovery resulting from better aeration, agitation and atomization.

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Donal B. Botkin, vice-president of manufacturing; James F. Bishop, secretary and treasurer; Robert J. Henry, assistant secretary. Donal B. Botkin, Pierce Butler, Jr., Frederic Crosby, Donald D. Davis, Stanley M. Hunter, Howard S. Johnson, Philip L. Ray, Carl Schabtach, Harold O. Washburn, Edwin White and Jessel S. Whyte have been elected directors.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has appointed C. Stuart Haagensen as manager of the employment department, and Michael F. Biancardi as manager of the health and safety department. R. W. Dugan, engineer's assistant in the crushing, cement and mining section of the basic industries department, has been reassigned to the district office. Philip Chen has been named factory representative in Shanghai, China, for the general machinery division's export department.

Chase Bag Co., Chicago, Ill., has transferred V. F. Radcliffe, New York sales representative, to the Detroit sales staff. The annual managers conference was held in Chicago, Ill., recently, with R. N. Conners vice-president and general sales manager, in charge of the meeting. The year 1947 is the Centennial Anniversary of the company.

Bath Iron Works Corp., Bath, Me., has announced the purchase of all outstanding stock of the Pennsylvania Crusher Co., Philadelphia, Penn., which is one of the oldest concerns in the crusher business. The following officers and directors have been elected: W. S. Newell, president; J. Wm. Schulze, vice-president and treasurer; A. H. Kretschmer, secretary and assistant treasurer; and S. D. Hartshorn, acting general manager. At their own request, G. W. Borton, former president and general manager, and W. A. Battey, former vice-president, have retired, but will continue to act as directors. The following also have been elected members of the board of directors of the crusher company: W. S. Newell, J. Wm. Schulze, S. D. Hartshorn, J. Kenneth Hall and John R. Newell.

Lima Locomotive Works, Inc., Lima, Ohio, has been awarded a certificate of merit by the Industrial Commission of Ohio, Division of Safety and Hygiene, for having the best safety record of the heavy industries division for 1946.

Griffin Equipment Corp., New York, N. Y., has been appointed distributor by the General Motors Corp., Detroit Diesel Engine Division, in Metropolitan New York, southern New York State and northern New Jersey, in charge of H. J. Hush, vice-president of the company.

Hewitt-Robins, Inc., Passaic, N. J., announces that the Birmingham, Ala., office of Robins Conveyors Division has been consolidated with that of the Hewitt Rubber Division and will now be located at 615 North 9th St., Birmingham.

The Harrington & King PERFORATING Co.

5650 FILLMORE ST., CHICAGO 44, ILLINOIS
114 LIBERTY ST., NEW YORK 6, N. Y.

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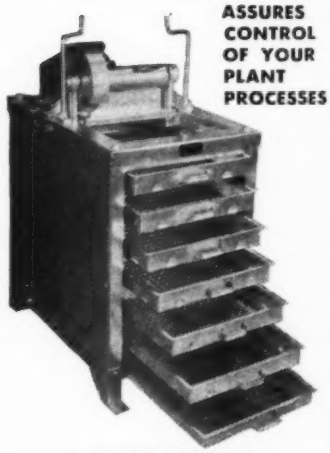
MECHANICAL TESTING SCREEN



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GILSON SCREEN COMPANY
BOX 186 MERCER, PA.

Detroit Diesel Engine Division of General Motors Corp., Detroit, Mich., has opened a model parts department in Detroit as an educational service to distributors.

Magnolia Metal Co., Elizabeth, N. J., has acquired the Evans Engineering Co., Waukesha, Wis., which will be operated as a division of the Magnolia company.

Four Wheel Drive Auto Co., Clintonville, Wis., has consolidated the sales promotion department and advertising department under the managership of M. O. Stockland, Jr., who has served as sales promotion manager since the organization of that department early in 1946. This move came as a result of the retirement of Francis M. Higgins as advertising manager in order that he might devote all of his time to his work as president of the Wisconsin Central Airlines. Mr. Stockland has been connected with the company since 1922 and has been located at Clintonville since 1936 when he was named assistant export manager under the late Charles Thomson. He has been manager of the department since 1938 until his appointment as sales promotion manager.

M. O. Stockland, Jr.

International Harvester Co., Chicago, Ill., has announced the following changes in branch management: A. C. Lanham, formerly sales manager, Indianapolis, Ind., motor truck branch, is now assistant branch manager, Salt Lake City, Utah, succeeding F. R. Kemple; L. W. Madery, formerly sales promotion manager, Saginaw, Mich., has been made assistant manager, Indianapolis, Ind., motor truck branch; A. F. Jackson, formerly assistant manager, Richmond, Va., truck branch, has been transferred to Tulsa, Okla., in same capacity; H. E. Broadwell, formerly retail motor truck manager, Spokane, Wash., now assistant branch manager, Billings, Mont.; J. W. Cooper, formerly manager of Harrisburg general line branch, now manager of new parts depot, Baltimore, Md., which will open in July, 1947.

Nordberg Mfg. Co., Milwaukee, Wis., announces that sales development activities of the crusher and process machinery divisions will be under the jurisdiction of Jack D. Grace, former editor of *Excavating Engineer*.

Davey Compressor Co., Kent, Ohio, has appointed Floyd Jones as sales manager of the portable compressor division.

Mack Trucks, Inc., New York, N. Y., announces the appointment of Leonard E. Matzner as advertising manager.

Meet today's cement demand *today* with TDA

Mr. Production Executive—TDA is the answer to your problem of increasing finish mill output immediately—right now—without the need for fixed capital investment or long delays for delivery of new equipment. We make this claim based on over ten years plant experience where we have seen TDA increase finish mill production up to 30%—time and time again.

And a second advantage you get from using TDA is that you can terminate its use when the present increased demand returns to normal and your plant will not be loaded with an expensive fixed investment in unneeded equipment purchased at inflated prices.

As to cost, the increased production more than pays for the TDA used in reduced finish mill grinding costs. In addition, you know that every barrel of cement you produce over normal production is pure "gravy."

We don't claim that TDA is a cure-all for every production problem, but if your plant has a bottleneck in the finish grinding mills, we believe it is worth investigating to see what TDA can do in your mills. Our experienced engineers will be glad to show you how TDA has worked profitably in many other plants.

DEWEY AND ALMY CHEMICAL CO.

CHICAGO, ILL. CAMBRIDGE 40, MASS. OAKLAND, CAL.

IF YOU HAVE A DRY PROCESS PLANT AND RAW GRINDING IS A BOTTLENECK . . . TRY RDA

PULVERIZERS

Hundreds of Installations . . Use Bradley Pulverizers

for the reduction of

AGRICULTURAL LIMESTONE
Cement Materials and all
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CAPACITIES: 1 TO 50 TONS PER HOUR
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BRADLEY PULVERIZER CO.

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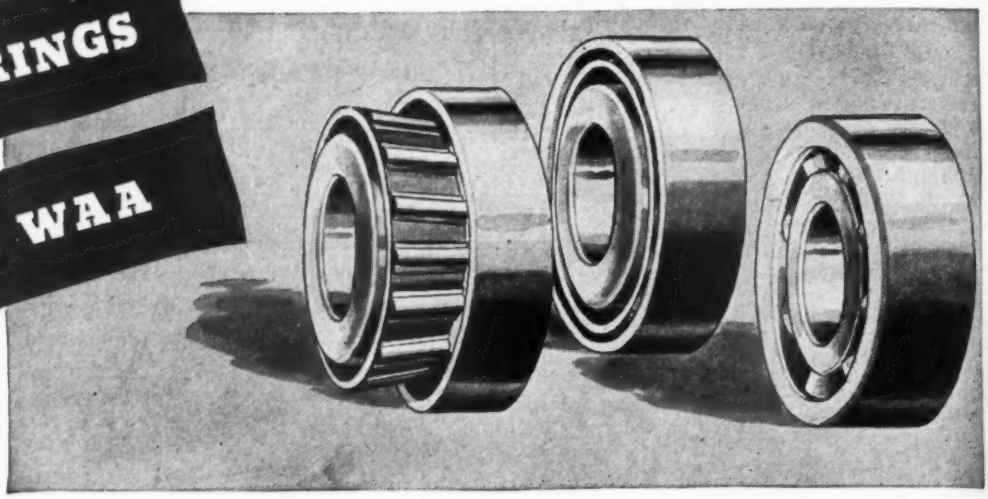
START ROLLING ON BEARINGS FROM WAA

SET YOUR OWN PRICE IN SEALED BID SALES



Get your bearings from the $20,000,000 stock now being sold by WAA. Friction and anti-friction bearings and components in all sizes and types are included in this stock. Many sizes are available in production-run quantities. Set your own price on what you need and submit your bid. Get all pertinent information from your nearest WAA Regional Office—go there to make your own inspection.

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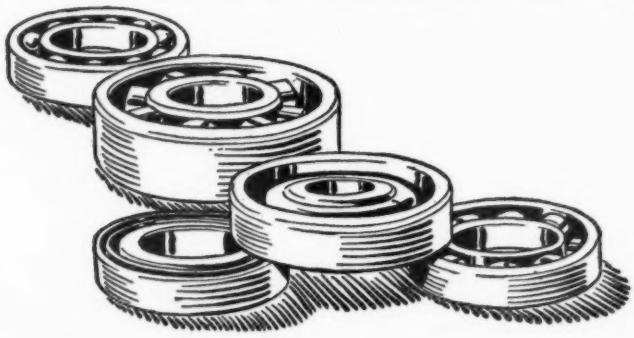

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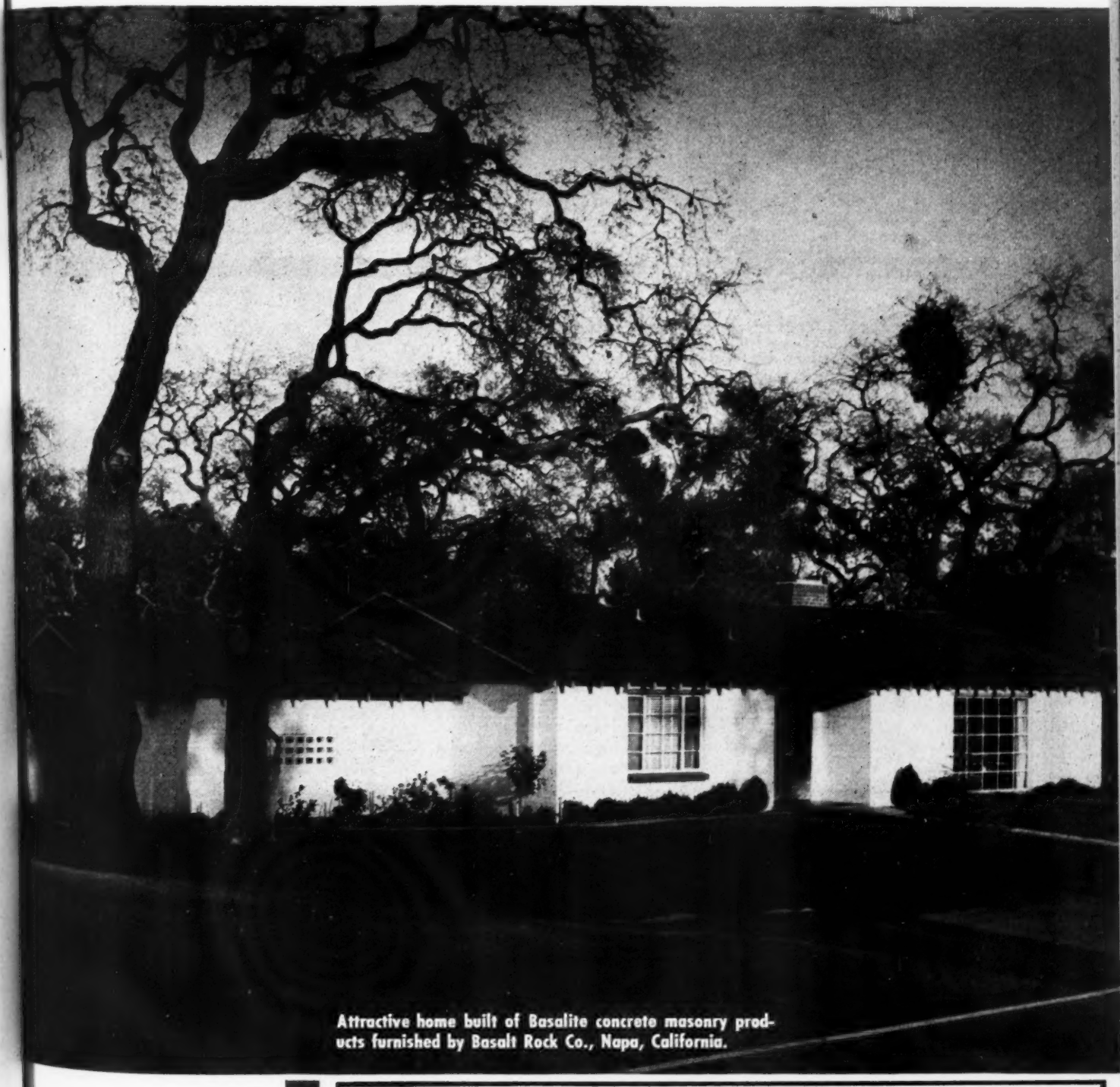
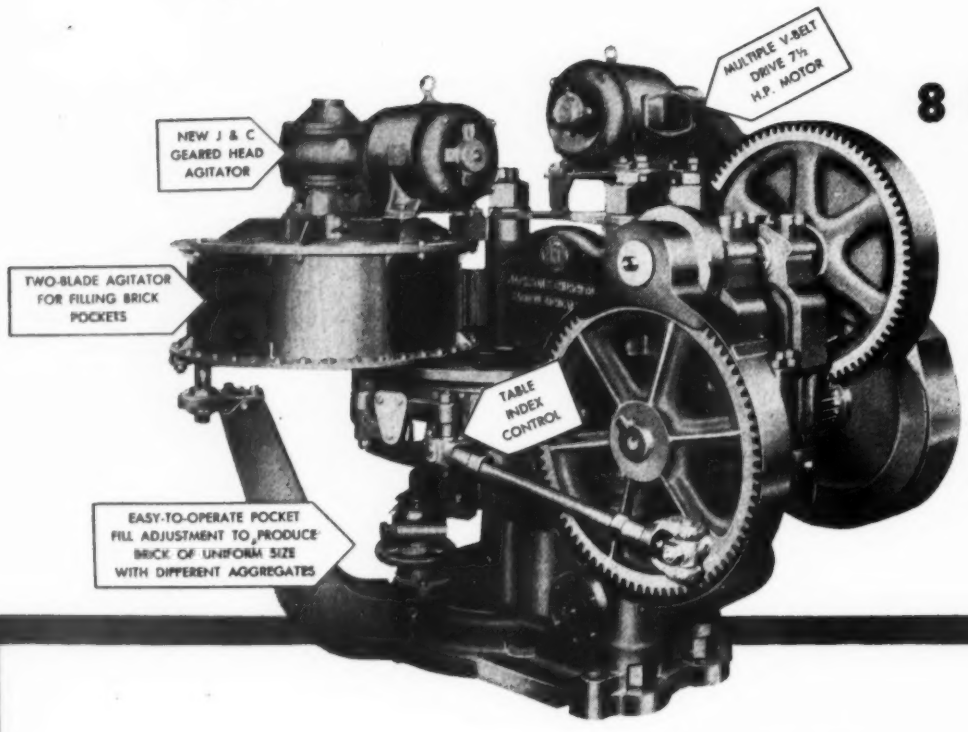
CONCRETE UNITS • READY-MIXED CONCRETE



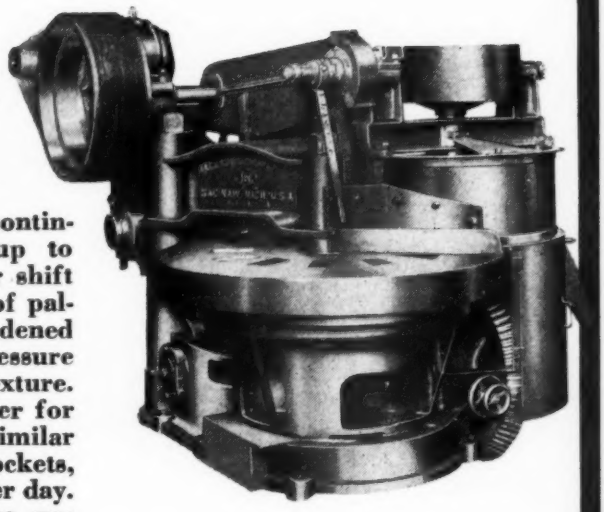
Attractive home built of Basalite concrete masonry products furnished by Basalt Rock Co., Napa, California.

a section of Rock Products

GET 14,000 CLEAN, SHARP-EDGED BRICK PER 8 HOUR DAY


MULTIPLE V-BELT DRIVE 7½ H.P. MOTOR
NEW J & C GEARED HEAD AGITATOR
TWO-BLADE AGITATOR FOR FILLING BRICK POCKETS
TABLE INDEX CONTROL
EASY-TO-OPERATE POCKET FILL ADJUSTMENT TO PRODUCE BRICK OF UNIFORM SIZE WITH DIFFERENT AGGREGATES

Left: J & C Model NC Brick Machine turns out 14,000 brick per 8-hour day. Below: Model A Brick Machine, capacity 28,000 smooth, sharp-edged, square cornered concrete sand-lime brick per day.

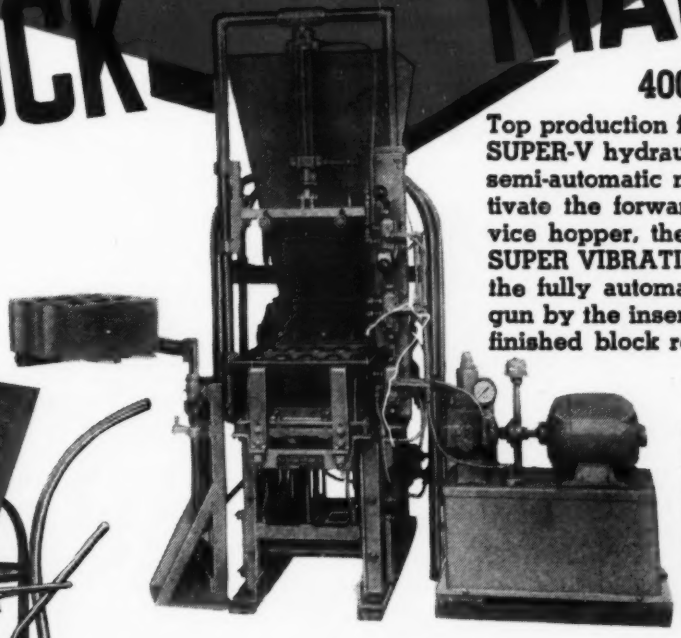


Just install one or more of the new J & C Model NC Brick Machines in your plant . . . and watch the brick pile up for delivery to your most exacting customers in the building trade. With 6 pockets in the rotary table turning out clean, sharp-edged, square-cornered brick in a continuous molding cycle, this machine produces up to 14,000 concrete or sand-lime brick every 8-hour shift . . . smoothly and economically, without the use of pallets. Automatic feed control precisely fills each hardened steel-lined pocket, and approximately 75 ton pressure compresses every brick to true size and uniform texture. Modern gear head design with independent power for feeder and feed agitator. The Model A Machine, similar in principle to the Model NC but built with 12 pockets, turns out 28,000 brick of the same high quality per day. Regardless of which size your production requires, use the brick machine that turns out the strong, sharp-edged concrete and sand-lime bricks preferred by contractors and masons . . . use J & C Brick Machines. Write for literature.

A PRODUCT OF J&C

JACKSON & CHURCH CO., SAGINAW, MICHIGAN

WHEN HIGHER QUALITY BLOCK ARE BUILT —THEY WILL BE BUILT ON A GEORGE SUPER V MACHINE



400 BLOCKS PER HOUR

Top production figures are reached on this George SUPER-V hydraulically operated machine. On the semi-automatic model, three finger-tip controls activate the forward and reverse motion of the service hopper, the famous George PRESS-PAC and SUPER VIBRATION, and the stripper carriage. On the fully automatic model, the entire cycle is begun by the insertion of a pallet, and ends with the finished block resting upon the off-bearer.

Call, wire, write or visit our plant for further information about how a complete George block plant layout can produce highest quality masonry units faster . . . FOR YOU.

150 BLOCKS PER HOUR

This single unit machine, the "Little George," is designed to fill the need of the small block plant or supplement the output of a larger one.

250 BLOCKS PER HOUR

The two-unit manually operated machine turns out highest quality masonry units through George SUPER VIBRATION and the exclusive PRESS-PAC operations.

F. C. GEORGE MACHINE CO.

100 S. WESTMORELAND DRIVE

Orlando **Florida**

BESSER Helps to Sell VIBRAPAC QUALITY BLOCK

Today — it is comparatively easy to sell concrete block. But the time is coming, and it may be soon, when you will again have to put on an intensive campaign to SELL the contractor and consumer on the merits of concrete masonry. Have you the necessary "sales tools" for such a campaign?

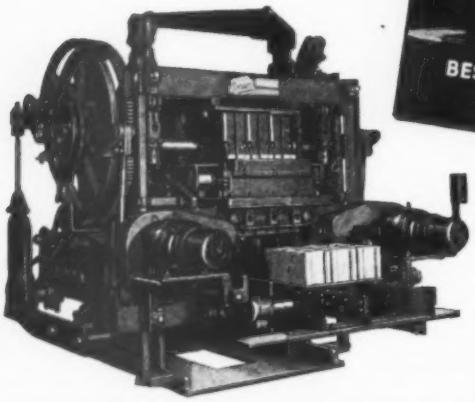
The BESSER Manufacturing Co. is prepared to assist every Vibrapac Block plant operator in the sales promotion and constructive utilization of concrete masonry . . . supplying effective literature, electros of concrete block buildings, mats of newspaper ads, radio script, etc. We urge every plant operator to make use of this material . . . NOW . . . for a better recognition of concrete masonry as an ORIGINAL building material, and to assure increased Vibrapac Block production in future years.

24 PAGE CONSUMER BOOKLET

Presents the many advantages of Concrete Masonry construction from the standpoint of the home owner. Written in simple, easily understandable, non-technical language. Imprinted with Vibrapac Plant operator's name and address for distribution directly to home owners, or for re-distribution through builders, architects and building supply dealers. A nominal charge is made for each booklet.

MATS OR ELECTROS FOR ADS

Individual mats or electros of any or all of Besser modular standard units may be obtained free of charge for use in locally prepared newspaper advertisements or printed matter.



RADIO SCRIPT

Sell the general public on the merits of Concrete Masonry through your local radio station. Besser will furnish you with radio script for spot announcements.

BESSER SUPER VIBRAPAC produces three 8" x 8" x 16" block at a time on one plain pallet. Fully automatic including pallet feeding. One man off-bears full machine production with the help of a Besser Off-bearing Hoist.

BESSER MANUFACTURING COMPANY
COMPLETE EQUIPMENT FOR CONCRETE PRODUCTS PLANTS
204 - 47TH STREET, ALPENA, MICHIGAN, U. S. A.

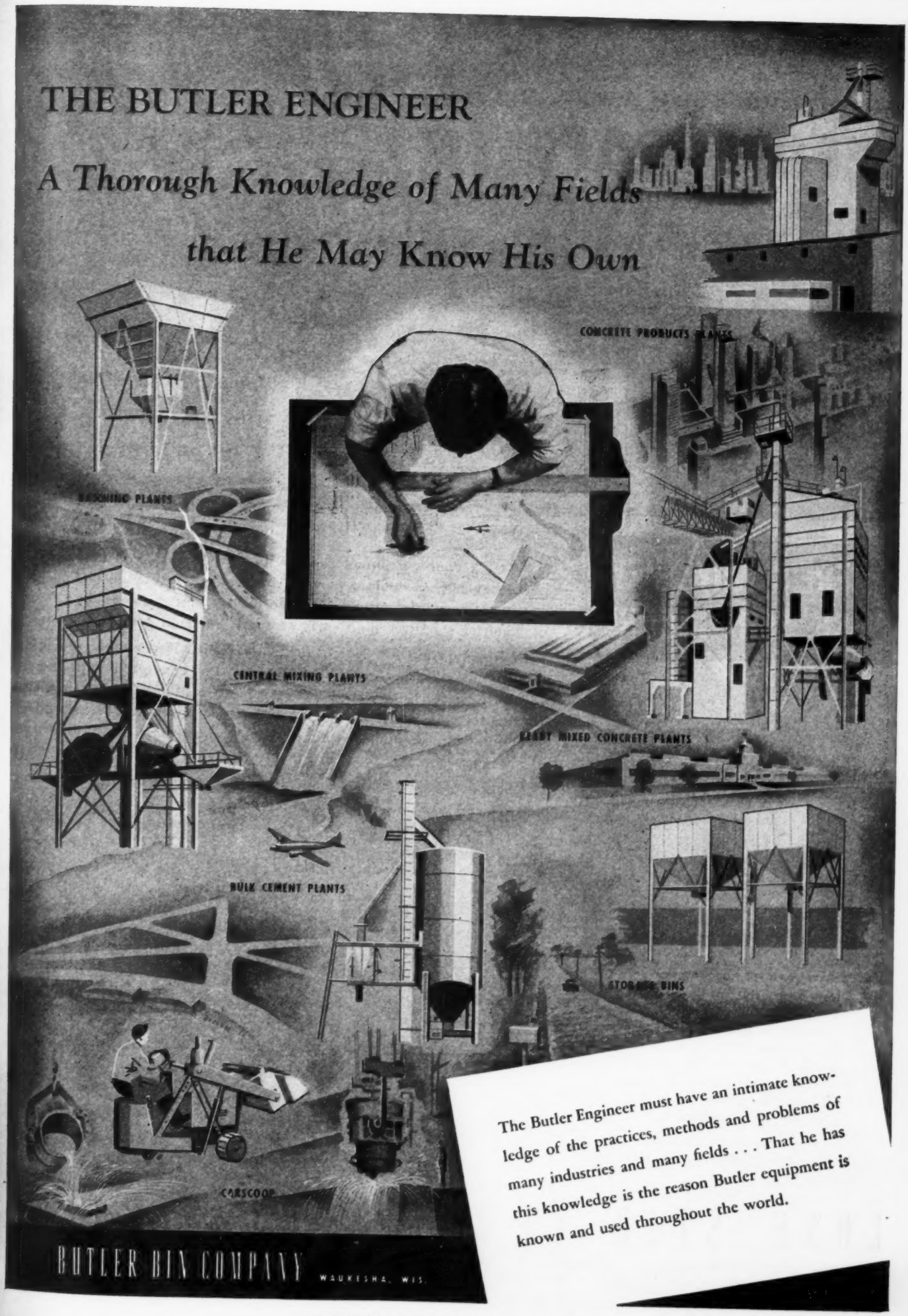
CONCRETE MASONRY FIRE-SAFE
CONCRETE MASONRY Gives this Home GREAT DURABILITY
CONCRETE MASONRY FOR ALL TYPES OF COMMERCIAL BUILDINGS
CONCRETE MASONRY is extensively used in THE FINEST BUILDINGS
CONCRETE MASONRY FARM BUILDINGS
CONCRETE MASONRY

BESSER PLAIN PALLET VIBRAPACS

THE SAVING IN PALLETS WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

THE BUTLER ENGINEER

A Thorough Knowledge of Many Fields that He May Know His Own



The Butler Engineer must have an intimate knowledge of the practices, methods and problems of many industries and many fields . . . That he has this knowledge is the reason Butler equipment is known and used throughout the world.

BUTLER BIN COMPANY WAUKESHA, WIS.

HERE'S WHY THEY ASK FOR 'INCOR'

New York City Fire Dept. Repair Shop, Long Island City. City of New York, Department of Public Works; Architects: A. G. Lorimer, former Chief; A. J. Daidone, present Acting Chief, Bureau of Architecture. Engineers, Roberts & Schaefer Co., Chicago. Ready-Mix Concrete, Central Concrete, Inc., Brooklyn, N. Y.

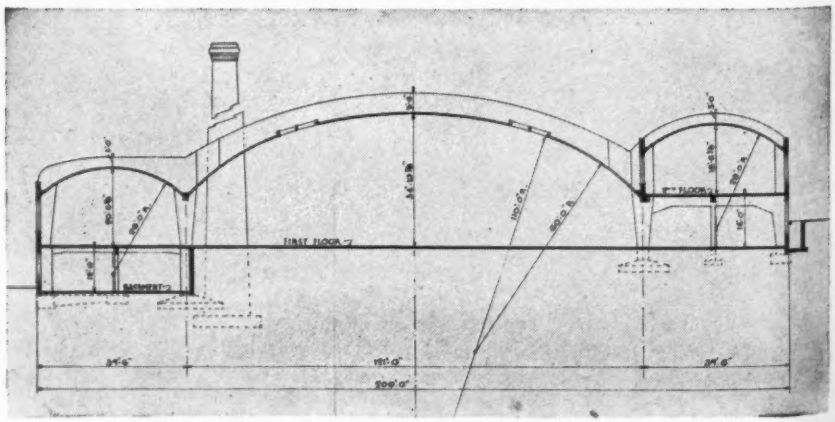
General Contractor:
Corbetta Construction Co., New York

WHEN your customers ask for 'Incor' concrete, you may be sure they have a definite purpose in mind . . . they've planned the job in terms of time, form and overhead savings assured by the use of America's FIRST high early strength portland cement.

In Repair Shop for New York City's Fire Department, covering two city blocks, barrel-arch structures were concreted with 'Incor' . . . elsewhere, Lone Star Cement was used. 'Incor' saved time-loss waiting for concrete to harden . . . even in cool weather, safe stripping strengths were obtained within 48 hours . . . result, maximum speed at minimum cost.

Job performance like this explains why leading Ready Mix Operators make 'Incor'* concrete available at all times, as part of their good service. 'Incor' economies broaden the market for concrete and that means more business for you.

*Reg. U. S. Pat. Off.



LONE STAR CEMENT CORPORATION

Offices: ALBANY • BETHLEHEM, PA. • BIRMINGHAM • BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS • JACKSON, MISS. KANSAS CITY, MO. • NEW ORLEANS • NEW YORK • NORFOLK • PHILADELPHIA • ST. LOUIS • WASHINGTON, D. C.

LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 15 MODERN MILLS, 25,500,000 BARRELS ANNUAL CAPACITY

Pumice

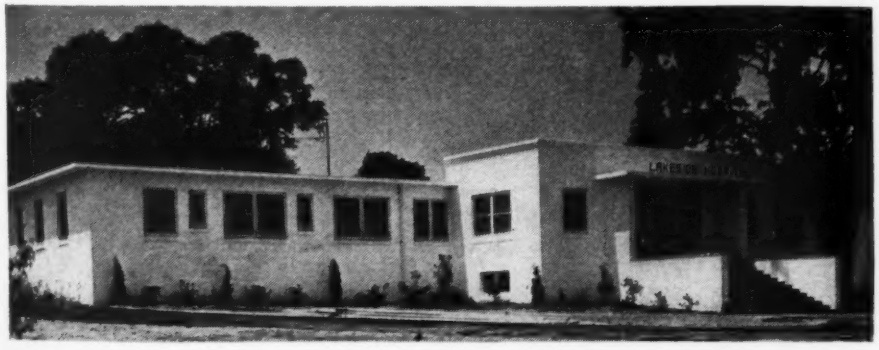
Basalt Rock Co. will have three attractive concrete products plants, using pumice aggregates. Model house displays and other advanced sales promotion methods

Construction view of Stockton, Calif., plant now nearing completion

Building Third Modern Block Plant

By W. B. LENHART

ABOUT 10 years ago, the Basalt Rock Co., Napa, Calif., a large producer of aggregates, started a small concrete products plant. For the first five years the business was conducted at some loss, but it was a period in which ideas were tried out and a thorough working knowledge was gained. Increasing demands resulted in the construction of a large, modern plant at Napa. This plant, operated under the name of the Basalt Rock Co., Basalite Division, and described in previous issues of ROCK PRODUCTS, is headed by G. W. Kay. Last year the plant was enlarged by the addition of a third Besser Vibrapac bringing plant capacity up to 14,400 block of 8- x 8- x 16-in. size or equivalent per 8-hr. shift. In addition the company is now building a new plant at Stockton, Calif., that will serve the immediate area including that of the lower San Joaquin valley. A third plant is going in at Sunnyvale. This is just a few miles north of San Jose, Calif., and will serve the South San Francisco Bay, Alameda, and South Oakland districts. All these plants will be equipped with Besser Vibrapacs. Thus the Basalt Rock Co., Basalite Division, with its own pumice deposits only five miles north of Napa as a source of raw materials will be in a highly competitive position to serve this vast, sprawling and rapidly growing section as far as concrete pumice aggregate masonry units are concerned.



Small hospital constructed with 8- x 8- 16-in. units

Frozen food plant at Santa Rosa, Calif., using 8- x 8- x 16-in. units

Plant Should Demonstrate Its Own Products

When A. G. Streblow, president of the company, decided to build the two new plants he determined that the plants should first be located in centers of population, and secondly, said centers of population should be reached by a reasonable rate. Studying maps and correlating them with freight rates from Napa, he selected Stockton and Sunnyvale as the sites for his new plants. As a second major consideration, the new plants must be on major highways.

Mr. Streblow wanted his new plants on the highways because they will be large plants designed to give the impression of stability, usefulness and with a modernistic eye to architectural beauty. In addition to the plant and the storage yards around them, all of which will be laid out with the idea of attracting the eye of the passing motorist, there will be built a large display room. At the Napa plant, a large area is now being leveled off and adequately drained for the construction of the display room. The area around each plant and show room will be landscaped. It is believed that this manner of demonstrating the actual use of concrete products for both beauty and utility in construction, will be a very effective method of promoting sales.

Big Market for Large Structural Concrete Slabs

Mr. Streblow sees a great future for the use of concrete structural units and cites as a case in point the use of concrete bridge deck sections for highway construction purposes. Contractors in California are losing their shirts, it was said, on bridge structures. They have mechanized equipment for excavating the piers

Low-cost home constructed of 8- x 4- x 16-in. Basalite concrete masonry units and tile shingles

and ready-mixed concrete can usually be used for pouring these sections. But the labor involved in building the span, particularly the great amount of carpenter work involved, is all out of line. Therefore why not a pre-cast reinforced concrete slab made up in sections of say, 32 ft. (or even longer.) These sections can be cheaply fabricated at the plant and, with modern haulage and handling equipment, can be easily transported and placed. The new plants are being designed with provision for a 10-ton capacity electric crane, spanning the yard and mounted at considerable height so that similar structural units can be fabricated. The idea is fundamentally sound and this company will sell the idea to the state engineers, architects, and contractors.

Advertising and Sales Promotion

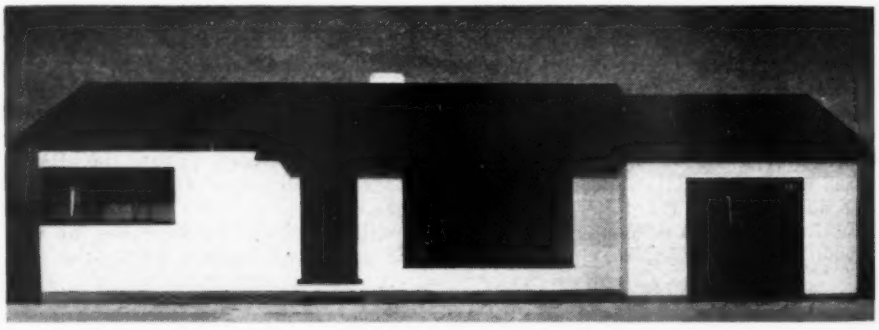
Owners of this progressive company believe in advertising, but to advertise concrete products effectively, such advertising should cover a considerable area. Obviously, it would not be economical to advertise in a newspaper if the company is unable to serve the area reached by the newspaper's city and urban circulation. By placing the industry in strong hands and with an aggressive advertising and sales campaign, Basalt is convinced that the concrete products and concrete masonry business will enjoy a steady growth.

Recently in two cases the Basalite Division of Basalt Rock Co. has demonstrated what can be done by vigorous advertising backed by an able sales force. Before OPA lifted restrictions on home building, the Napa plant was running three shifts as the Basalite blocks were in much demand for home building. With the lifting of restrictions a large part of the construction activity of the Bay area shifted into other types of work so that the plant went on a one-shift basis. When this happened, the company threw the sales and advertising departments into high gear and within 45 days the plant was back on a two-shift basis and it is expected to be on three shifts very quickly. The second instance was when the engineering department designed several concrete dairy barns of modern and attractive appearance. Now one would normally think that a dairy barn had "limited use" for concrete products, but the selling job was tackled with enthusiasm and the results have surpassed the company's fondest hopes. Recently a moving picture was shown in which a dairy man lost his entire herd of cattle from fire. Driving home these favored points for concrete products is the keystone of the business.

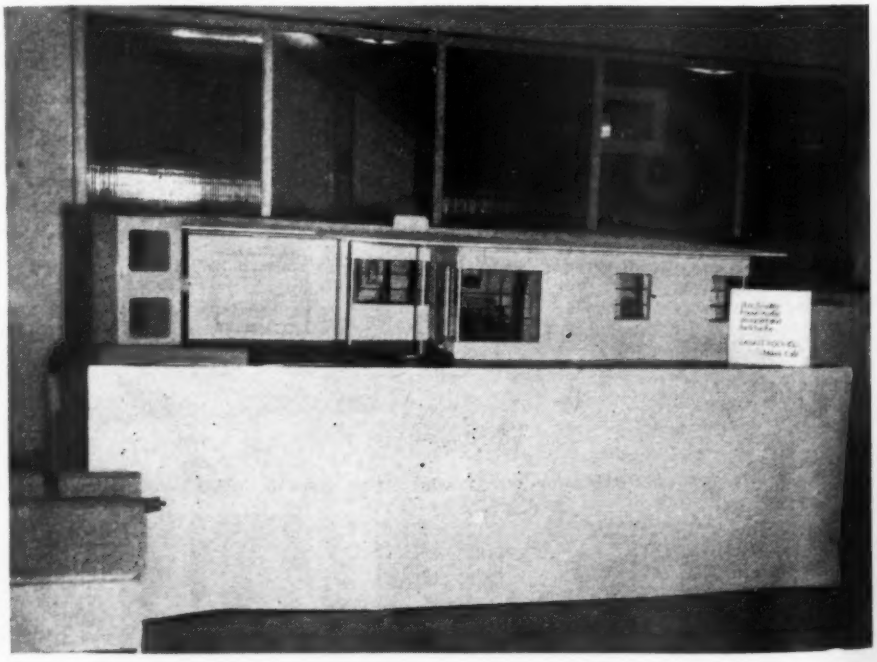
Although the number of salesmen employed is not large, the sales staff is effective. Under the direction of Malcom McIntyre, sales manager, the salesmen are provided with several sales kits. One is intended for architects, engineers, contractors, etc. It is a loose-leafed, letter size handsomely gotten up book in which are some 40 pages of drawings, specifications, uses and such a mass of engineering data relating to concrete masonry units that one cannot help but be impressed. A second kit is a leather case holding a large number of 8- x 10-in. photographs of homes and buildings in which Basalite products have been used. From a quick glance at these photographs, one can get a glimmering of the possibilities for masonry construction. The many homes shown display a warmth and beauty that stimulates a desire to possess such a home.

Model Home Displays

Last, but not least by any means, is the display of model homes prepared under Mr. Streblow's direction. First, detailed plans were drawn up of many different house types by the



Another small home model which lends itself to expansion for additional rooms



One of the concrete block house models, built to exact scale, so that architects and builders may properly visualize how the completed house will look. The house also is equipped with scale model furniture, drapes, etc., making an attractive display for the general public

company's engineers and architects. From these plans 14 designs were selected and from each design a model home was built on a scale of 1½-in. to the foot. Each model is about the size of a business office desk. Every detail of the proposed home is carried out to scale. Each is furnished in miniature furnishings that are also to scale; reading lamps, twin beds, book cases, rugs, toilet fixtures, all beautifully assembled under the direction of a well-known interior decorator. At each of the new plants the display rooms will have a full set of these house models, and in one ship-loft of Mr. Streblow's shipbuilding company, a crew of men; carpenters, painters, interior decorators are now busily engaged in making up these additional display homes. Another set of models will be provided as a semi-portable display section. This unit will visit the various county fairs culminating in the State Fair at Sacramento.

Models now on hand and from which the others are being copied have been placed on exhibition several times, first in Napa where the display was received with delightful enthusiasm. The home models were then sent to San Jose, Calif., for display in Hart's Department Store. They were also displayed at O'Conner & Moffits Department Store in San Francisco. As these two stores are the ultimate as far as class and distinction are concerned in their respective cities, the models were seen by literally tens of thousands of people. It was a public service on the part of the store owners and brought many visitors to their doors. It was an eye-opener to the prospective home owner for he could see what a field concrete masonry units offered for the exercise of a home owner's imagination.

The part that the Basalite Division of Basalt Rock Co. will play in the final phases of this home building will be; first, to supply the home owner with detailed plans and specifications for his home; second, supply him with the infinite variety of structural masonry units that Basalite Division will make for use in the proposed home; and, third, to supervise with his architect the final completion of the home so as to get the maximum benefits that the products afford. In the completed houses radiant heat, indirect lighting, and all the modern trends that can be effectively incorporated will be used.

Manufacture Concrete Stave Silos

Gastonia Concrete Products Co., diversifies its production with the manufacture of silos, concrete block, and many precast products

PLACED in operation in August, 1946, the new plant of Gastonia Concrete Products Co., Gastonia, N. C., features rather unusual storage facilities for aggregates in addition to an efficient curing system. Aggregates are stored in two concrete silos, fed by a bucket elevator common to both. The silos, each 30 ft. high and 13 ft. in diameter, are patented Moose concrete silos, originally developed for farm use but now also used extensively for industrial purposes. The company manufactures and erects these silos.

Precast concrete steps in demand

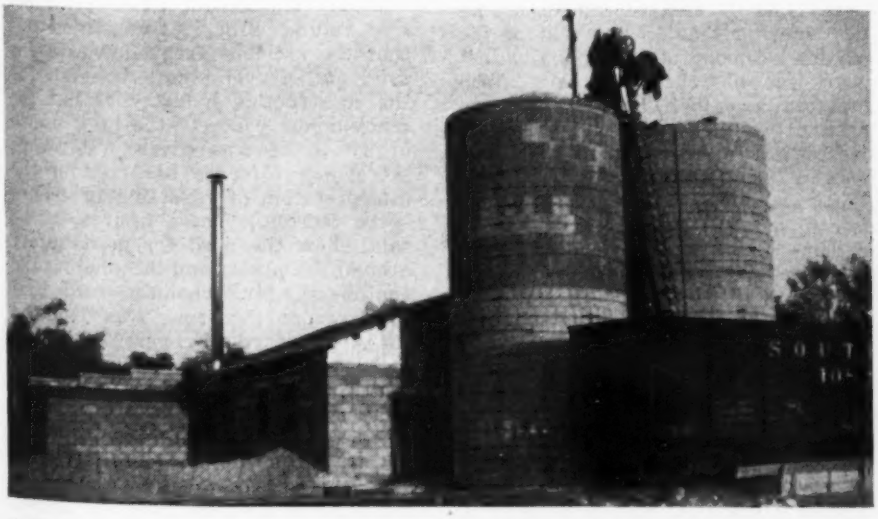
A sloping flooring has been constructed about 10 ft. from the top that sends aggregates, discharging into the silo from the bucket elevator, directly into a chute serving the plant. When the discharge gate is closed, the aggregates fill the top of the silo until they overflow at the rear of the sloping floor where a 2-ft. section has been removed. Aggregates stored in the lower 20 ft. of the silo can be returned through manual discharge gates to the bucket elevator for return to the top.

Under the spur track on which railroad cars deliver aggregates to the plant is a pit into which the cars discharge. A Telsmith bucket elevator picks the aggregates up from this pit and delivers them to either of the two silos through a turnhead.

The chute leading from the silos into the plant is calibrated at the lower end to a certain volume so that when filled to the proper point, the desired amount of material is ready to be discharged into the mixer. A wooden gate placed at the calibrated point in the chute prevents more than the desired amount to enter the measured area.

Crushed limestone and concrete sand aggregates are introduced into a 12-cu. ft. Multiplex mixer where bagged cement and water are added. The concrete mix is elevated to the hopper of a Multiplex tamper by drag conveyor. Finished units, placed on wooden racks, each holding 50 block, are delivered to curing rooms by a Yale-Towne Transporter lift truck. There are six rooms, each with a capacity of 400 standard units and equipped with 120 ft. of pipe coils. The bottom section of pipe is perforated with small holes to introduce steam into the curing rooms to insure sufficient moisture for proper curing. A 20-hp. vertical boiler, stoker-fired by a Holcomb and Hoke Manufacturing Co. "Fire Tender," provides steam for curing. After curing, the units are moved to yard storage in a concreted area. Production capacity is 175 units per hour.

Floyd McLaud, owner of the Gastonia Concrete Products Co., and a charter member of newly formed North Carolina Concrete Masonry Association, also operates another plant where concrete specialties are produced. All items are cast and such products as concrete stepping stones, concrete steps, Norwalk burial vaults, lintels, sills, copings, fence posts, and any desired precast units are made.



Looking to the rear of plant showing concrete storage silos for with bucket elevator serving both bins

Expect Big Volume In 1947

National Ready Mixed Concrete Association convention in Los Angeles deals with labor relations, merchandising, air-entrained concrete, and new markets

MANY of the convention papers and events of interest to the ready-mixed concrete industry are abstracted in the report of the National Sand and Gravel Association convention, also in this issue of ROCK PRODUCTS, but papers and discussion specifically before the 17th annual convention of the National Ready Mixed Concrete Association are reported herein.

FRANK P. SPRATLEN, Jr., Denver, Colo., was elected president of the National Ready Mixed Concrete Association; C. "Dolly" Gray, Indianapolis, Ind., vice-president; and Robert F. Porter, Towson, Md., secretary-treasurer. New members of the Board of Directors are John W. Roberts, Southern Materials Co., Richmond, Va.; Walter F. Tews, Tews Lime and Cement Co., Milwaukee, Wis.; A. W. Kimmel, Ready Mixed Corp., Dayton, Ohio. R. K. Humphries, Pacific Coast Aggregates, San Francisco, Calif., whose term expired in 1947 was re-elected to the Board.

In his acceptance of the presidency, Frank P. Spratlen, Jr., commented on the growth of the ready-mixed concrete industry to its present status in excess of a $100,000,000 annual volume of business. He was lavish in his praise of the abilities of V. P. Ahearn and Stanton Walker.

As to future plans, he said the Association will expand its work in the field of labor relations, merchandising, engineering and in the development of a safety program for the industry.

CHARLES W. SHIREY, president, opened the National Ready Mixed Concrete Convention with a short address wherein he complimented the Southern California group for the excellence of the convention program, particularly that portion devoted to the ladies. Mr. Shirey stated that during the year membership had increased about 25 per cent, there being 216 members at the start of 1946 and 265 at the beginning of 1947. Associate membership showed an increase from 34 to 39 members.

VINCE P. AHEARN, executive secretary, followed with his annual report. He announced that the 1948 meeting would be held at the Netherland Plaza Hotel, Cincinnati, Ohio. He pointed out that the coming year will be a most excellent construction year and that the proposed 1,000,000 homes for vets will come nearer being accomplished than was a similar proposal for 1946. The most serious threat to the industry, he said, was the shortage of rail facilities. Transportation bottlenecks might be serious for the next two years, he said. The importance of merchandising of ready-mixed concrete was briefly dwelt upon, in urging that this subject along with price policies should be given serious thought by the members. He also commented on labor contracts, particularly urging that members study union phraseology so that a more understandable agreement by both labor and operators could be had. He said there was no nation-wide labor bargaining contemplated or desirable.

Mr. Ahearn, in commenting on predicted volume of construction expenditures of 13.3 billion dollars for 1947, gave some interesting cement statistics showing that 15 per cent of the portland cement used nationally last year was absorbed by ready-mixed concrete operators. He closed his report urging a standard method of accounting for ready-mixed plants.

Left: Frank P. Spratlen, Jr., Denver, Colo., new president, N.R.M.C.A. Right: Richard N. Coolidge, Nashville, Tenn., reelected president, N.S. & G.A.

STANTON WALKER, director of engineering, in his report, stated that during 1942 (the peak year) 24,000,000 cu. yd. of ready-mixed concrete was poured and that during 1946 the volume was 19,000,000 cu. yd. Of this total, 15,000,000 cu. yd. were delivered by members of the National Ready Mixed Concrete Association (roughly 80 per cent). He mentioned the research work being conducted at the Association's laboratory at the University of Maryland and detailed examples of the work underway such as studies of air entrainment, admixtures, etc. The part that the engineering staff was playing in the preparation of specifications was briefly dwelt upon, and mention was made of the studies on the use of non-agitator truck equipment in the handling of air-entrained concrete.

HARRY F. THOMSON, General Material Co., St. Louis, Mo., gave his report on the proposed safety contest and called attention to the fact that employe liability and property damage were closely tied in with personal safety. The design of the trophy sponsored by *Pit and Quarry* was approved.

Mr. Thomson said that the response to date in the contest was rather discouraging and that only 32 companies had reported for the two-quarter period ending July 1. He pointed out that the accident frequency rate for sand and gravel plants was 36, for the construction industry 31 but for ready-mixed concrete the high figure of 47 to 58 was given. (However, there was evidence of error in the interpretation of reporting procedure —the EDITOR.) These figures, as he said, show the need for more safety around the plants and in handling the equipment. Mr. Thomson said that roughly one man-hour was required for every cu. yd. of concrete delivered and, at $1.00 per hour for labor, that the cost to each operator, for accident compensation was 3 to 5 cents per cu. yd.; the former figure for the safer plants. When one considers the yardage involved, these possible cash savings due to a safer operation cannot be overlooked. He also ably brought out the fact that in many sections,

Left to right: Charles W. Shirey, Waterloo, Iowa, retiring president, N.R.M.C.A.; Robt. F. Porter, Towson, Md., newly elected secretary-treasurer, N.R.M.C.A.; Frank P. Spratlen, Jr., Denver, Colo., new president of the N.R.M.C.A.; Richard N. Coolidge, Nashville, Tenn., reelected president, N.S. & G.A.; Robert Mitchell, Los Angeles, chairman of the convention arrangements committee and past president, N.S. & G.A.; T. E. Popplewell, Fort Worth, Texas, reelected vice-president, N.S. & G.A.

the public seems to think that the "roller" ready-mixed concrete trucks on the highways constituted a particularly hazardous piece of equipment, indicating the need for a public relations department to off-set the possible dangers to the entire industry by local adverse rulings relating to use of such delivery trucks.

During the discussion on safety, Mr. Ahearn deplored the lack of interest by Association members in the safety program and stated that for the first time he realized there was a need for educating the public through a public relations office. He cited as an example that in Washington, D. C., ready-mixed concrete trucks were once threatened with a condition that might have prevented their use on that city's streets, because of the public's erroneous impression that such trucks were more unsafe than ordinary heavy truck equipment.

Mr. Shirey mentioned the need for safe drivers and for safe equipment and told how members of his organization checked with different traffic officers to find out if the drivers were doing anything that might be within the law, yet actions that might place truck deliveries in a poor light.

Truck Chassis Report

The report of the Committee on Truck Chassis was given by Mr. Thomson, the report being a joint effort of Stanton Walker and Mr. Thomson. This committee was organized during the summer of 1945 and it was assigned the problem of making a study of the industry's truck chassis problem. Questionnaires were sent to the members to develop information relating to points of weakness, or strength, in truck chassis but response was disappointing as only 29 companies reported, out of a list of more than 250. While the number responding was small, sufficient data was obtained to indicate that the studies should be continued. The report of the 29 companies, represented by 91 "returns," covered 354 trucks, a "return" being a report on a given make and model of truck for each size of truck mixer. A summary of the data covering the "points of weakness" of a truck follows, it being born in mind that that part of a truck where trouble is very seldom encountered (such as tire mountings) is rated at 0.00 with increased figure for the more troublesome parts:

	Rating
Tire Mountings	0.00
Helper Springs	0.11
Spring Hangers	0.11
Front Springs	0.11
Front Axle	0.13
Steering Gear	0.18
Tandem Axle	0.18
Transmission	0.20
Frame	0.24
Rear Axle Housing ..	0.25
Brakes	0.26
Engine	0.27
Propeller Shaft	0.33
Driving Axle	0.53
Rear Springs	0.58
Wheel Bolts	0.59
Clutch	0.67

Under the system used for arriving at these conclusions, 0.00 was a *no trouble* report and the worst rating would be 3.00, so a final rating such as 0.67 does not necessarily represent serious trouble.

Under the questionnaire's designation of "facilities added by owners," responses indicated the greatest need for towing connections, with frame additions coming second and more spring leaves, third. These suggestions, it was pointed out might be considered by the manufacturers of truck equipment.

Of the 354 trucks reported, 229 were two-axle and carried six wheels, and 125 were three-axled and carried 10 wheels. All but six were conventional models the former were cab-over-engine type. On the question of motive power (gasoline vs. diesel) insufficient data were gathered to arrive at a fair conclusion. Information was also sought as to the chassis weight and the gross vehicle weight. A study of the tabulations shows the great tendency of the industry to overload trucks. Data also were tabulated showing the weights carried by front and rear axles (or rear tandem assembly) which show that from 67.5 to 81.2 per cent of the total load is rear axle load. The latter figures were deemed high as brought out by later discussions, and designers of this type of equipment could give this some further study.

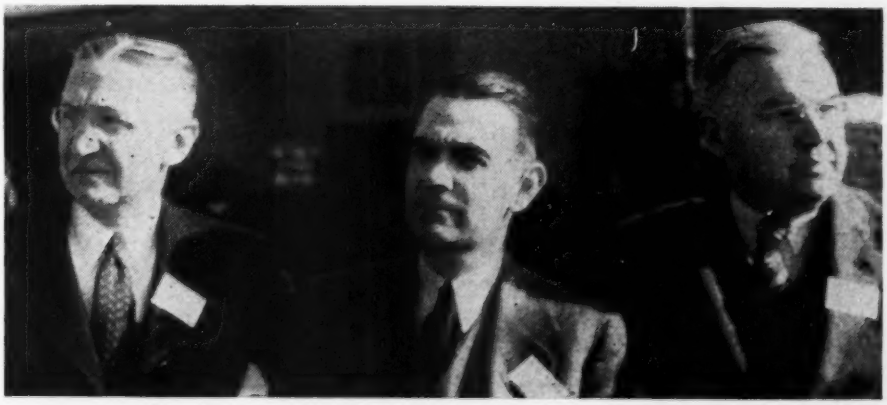
Area Labor Agreements

RICHARD W. LUND, counsel, Southern California Rock Products Association, in a paper, "Group Action by Producers in Development of Area Labor Agreements," before a joint session, pointed out that proposed legislation before Congress does not deal with the terms and conditions of collective bargaining contracts except in a very limited way. Prohibition of secondary boycotts and other expected legislation will improve the industry's bargaining position, he said. Collective bargaining will remain a necessity. His paper as a whole dealt with the advantages and disadvantages of negotiating labor contracts through local Association channels and he gave a brief account of the experience of the employers in southern California in that regard.

Left to right: V. P. Ahearn; Charles W. Shirey, retiring president, N.R.M.C.A., and Stanton Walker

At the outset, he pointed out that pending legislation to outlaw industry-wide bargaining, even if enacted, would not affect the subject, for that legislation is primarily directed at nation-wide, or regional-wide industry bargaining. His paper covered group bargaining by communities.

One of the main disadvantages, he pointed out was the loss of individuality, self determination, and that an employer might be bitterly opposed to such conditions as the closed shop, the check-off system, etc., yet the group, as a whole might approve of such conditions that it would be a bitter pill for the employer to swallow. Or, the employer who resists proposals to arbitrate wage proposals might feel that he was surrendering to the group considerable powers of management. Group negotiations require to a high degree that these powers be transferred by each individual employer to the employer negotiating committee. He likened this question to the perennial question of state rights vs. federal power. The question is so fundamental, he pointed out,



R. C. Collins, Warner Co., Philadelphia, Penn., Murray S. Simpson, Super Concrete Corp., Washington, D. C., and Alexander Foster, Jr., also of Warner Co.

G. H. and L. W. Tews, twins, of Tews Lime and Cement Co., Milwaukee, Wis.

that many employers resist group negotiations as vigorously as they resist negotiations with union officials.

The second objection to group action is that any uniform contract is likely to contain the most stringent provisions theretofore existing in the individual contracts. In other words, he said, the unions will usually insist that the master contract be based upon its most favorable existing contract, and an employer with an open shop provision may not want to team up with an employer who has a closed shop agreement. He pointed out that initial group contracts were a compromise of all the good and the bad features in each of the individual existing contracts.

A third disadvantage in group bargaining is that the group position is only as strong as the determination of the group's weakest members. He illustrated this by calling attention to a case where a majority might want to settle on a 10¢ wage increase, but others would not entertain thoughts of a strike for 5¢ additional, so the wage offer was compromised at 15¢.

A fourth objection, he said, in group negotiations was that should they lead to a national crisis the entire industry might be taken over by the government, and in such a case, the employer would be on the short end when final negotiations were completed. Anti-trust laws, too, must be observed, he pointed out.

To offset the disadvantages of group bargaining, Mr. Lund then proceeded to show some of the advantages and listed as a "first" the improved bargaining position. Under individual bargaining, the unions can (and do) pick off the weakest company financially, the most generous, or the one that can be bluffed the easiest, or who lacks the know-how of negotiation. A union will reach an agreement with such a company without a strike, and then tackle the next most vulnerable company. Group action is the only effective way of preventing unions from knocking them off, one by one. He cited several illustrations to bear out this point.

A second advantage, the speaker pointed out, was the elimination of wages as a competitive cost; one employer could not undersell the other because of wage costs nor would there be employers competing for men on a wage consideration.

A third advantage is that group participation brings out a freer exchange of information. Cost of surveys can better be borne by a group and a group can more cheaply be better informed. Group action also eliminates the "lone wolf" tactics, as Mr. Lund described that group or individual who has the mistaken notion he can make a sweeter deal with the union and therefore can expect leniency in the future from unions. Such precedents make it difficult for other employers. Other advantages cited were that group action reduced the personal element in bargaining; it facilitates observance of employer compliance with the contract; it permits avoidance of direct answers to members by union officers by deferring answers to the committee, and, makes uniform interpretation and application of contracts.

Mr. Lund then explained the steps that are necessary to make group negotiations work. First, he said, the group must include 100 per cent of all the employers in the industry in that particular section. Then he outlined the form of organization the employers should make and stressed the advisability of having a permanent staff to direct the organization. Forms of contract and the operation of contracts were also discussed. He stressed that before anyone attempted collective bargaining agreements that he have (a) the facts backed by examination of all union agreements carefully and a good working knowledge of each individual plant, (b) be fair and reasonable in dealings but be firm and (c) conduct his business as though he expected a strike and think of a strike in terms of one of the hazards of a business and as an operating cost.

Mr. Lund said there were 12 companies in the Southern California Rock Products Association and the Southern California Ready Mixed Concrete Association. Membership includes all but one rock company and four small ready-mixed concrete companies and represents about 95 per cent of the industry. These 12 companies are the contracting parties on each of the labor agreements the industry has with the several unions involved. The local Association, as such is not a party to the contracts but the negotiations are carried on by a three man committee appointed by the Association.

Tax Problems

The concluding paper of the joint session on legislative, labor and taxes, was a highly informative one entitled "Current Tax Problems in the Sand and Gravel and Ready Mixed Concrete Industries" by Robert Ash, Tax Counsel for the two industries.

The speaker said that much that was published in the press relating to possible tax reductions does not take into consideration the main facts. He said that those persons who advocated no income taxes for people with incomes below $2500 per year were ill-informed, for, to meet the cost of government as it is now conducted the little fellow has to carry his share of the burden; there are just not enough rich people to carry the load, he said.

He pointed out that the Knutson bill purposes that the tax cut on incomes in excess of $300,000 be 10½ per cent instead of 20 per cent and is aimed at a total tax reduction of 3½ billion dollars. If the 20 per cent cut is applied straight across it will mean that the persons with incomes of $5000 or less will get 55 per cent of the reduction, for that group pays 55 per cent of the total personal income taxes. A great number of statistics were shown, detailing the taxes paid by various income groups and to show the effects of increased exemptions.

Mr. Ash next took up the subject of the 3 per cent tax on transportation of property for hire and stated the industry should do what it could to secure its repeal. The tax is deductible in computing taxable income for income tax purposes. If a high bracket taxpayer deducts the 3 per cent transportation tax the net return to

Convention delegates on plant field trips were much interested in large haulage units in use at California plants. Here a group at S. H. Bacon Materials Co. ready mixed concrete plant inspects new truck-trailer combination. Roll-off trailer was built by Fruehauf Trailer Co. of California, and has an automatic drawbar coupler, shown in action

the government is small. More important, he said, however, is: (1) the discrimination between producers located at unequal distances from a common market and (2) the discrimination between producers who do their own transporting and producers who hire outsiders to transport their products, and (3) the almost unbelieveable number of instances where there can be a misunderstanding as to when and on whom the tax applies. Suppose you employ an independent contractor to remove the overburden or topsoil from a sand and gravel deposit, as an example, said Mr. Ash. The Treasury says the tax applies if you designate the place where the topsoil is to be deposited. However, if you do not tell the contractor where to place the overburden the tax is not applicable. A dispute can easily arise over such a situation, he pointed out. Other examples of the possibilities of serious disputes were also given.

Mr. Ash then discussed the Standard Hauling Contract and pointed out the danger to producers who have contractual relationships with owner-drivers, for with the advent of social security and the withholding tax, the status of these drivers is of great importance to the industries. An employer may think he is dealing with an independent contractor only to find later that said person is in his employ and he (the employer) may be faced (years later) with staggering liabilities. In August 1946, the speaker pointed out, the standard form of contract was sent to the membership. Those who have adopted the contract were requested to so inform Mr. Ahearn in writing. Or if any changes were made, it was suggested that Mr. Ahearn be advised of the changes or be sent a copy of the contract. Also, if the standard contract is questioned by any of the Bureau of Internal Revenue officials he suggested that Mr. Ahearn be notified. Thus such disputes can be placed before the proper Washington officials for a quicker consideration.

The speaker then discussed the subject of "Declining Balance Depreciation" and called the members' attention to the liberal attitude of the Bureau of Internal Revenue with respect to use of the declining balance method of computing depreciation. He said that in these industries the use of that method will be permitted with a rate equal to 150 per cent of the straight line depreciation rate. However, such will be granted only if the application for permission to use it is filed within 90 days, after the beginning of the taxable year in which the new method is to be used.

He explained the declining balance method of computing depreciation and illustrated it by supposing one had acquired an asset which cost $1000, has a 10-year life and no salvage value at the end of 10 years. The depreciation the first year would be $150 and the remaining undepreciated balance $850. Fifteen percent of $850 is $127.50 so that is the depreciation for the second year. For the third year, the depreciation allowance is $108.38. The method gives best results for accounts which are constantly replaced in substantially equal amount and to those accounts for property in which the greater proportion of the product is confined to the early part of the useful life. However, the speaker advised caution as to changing over now to the proposed method, for during the coming year there may be a general revision of the Revenue Codes, and he urged members to watch the situation closely to see what Congress does with existing codes. Probably, he said, the next revenue bill will involve changes in rates only and not a general revision.

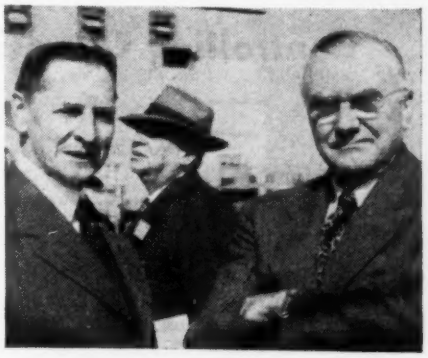
Study Percentage Depletion

Mr. Ash recommended that the Board of Directors study the problem of percentage depletion and, if they deem it advisable, to take such steps as necessary to secure the inclusion of a percentage depletion provision to apply to sand and gravel deposits.

The speaker spoke of Section 735 Relief, based on excess production during the war and, if any members obtained such relief, Mr. Ash would like to be so advised as there is one section now awaiting trial before the Tax Court. He also called attention to the fact that the Bureau of Internal Revenue has increased its staff quite materially, in fact 7,693 new investigating officers were added to the staff so one can expect a closer review of tax returns.

On the subject of uniform accounting methods, the speaker emphasized the need for adequate records for tax purposes and he recommended that the studies of this question (which were taken up several years ago) be resumed.

Clyde P. Harrell, Jr., told about "Zoning As It Affects Sand and Gravel Operations in Los Angeles County."



H. F. Thomson, General Material Co., St. Louis, Mo., and Stanton Walker

Robt. F. Porter, Harry T. Campbell Sons' Corp., Towson, Md., and Ed. J. Nunan, The Buffalo Slag Co., Buffalo, N. Y.

Claude L. Clark, Columbus, Ohio, and A. W. Kimmel, Ready Mixed Corporation, Dayton, Ohio, (new director of Ready Mix association)

John Redd, Super Concrete Corp., Washington, D. C., and Julius J. Warner, Richter Concrete Corp., Cincinnati, Ohio

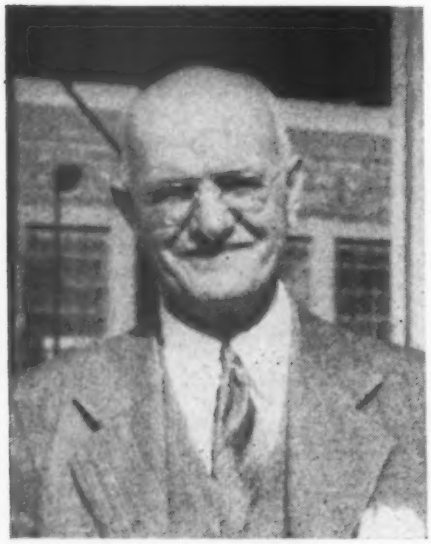
Controlling Quantity of Entrained Air In Concrete

PRESIDENT-ELECT FRANK P. SPRATLEN, Jr., was presiding officer for the final session of the National Ready Mixed Concrete Association, devoted to a consideration of air-entrainment in concrete, merchandising and sales promotion.

STANTON WALKER, director of engineering, first introduced Dr. A. A. Bates, recently appointed vice-president in charge of research, Portland Cement Association, Chicago, who commented briefly on the P.C.A. research and development program.

"Control of Quantity of Entrained Air in Concrete" definitely is here to stay because of its contribution to improved durability of concrete, its resistance to freezing and thawing, which improvement is measured in terms of several hundred per cent. Improved workability of the concrete, less segregation, less bleeding and water gain are other benefits that accrue from its use. Tests of air-entrained concrete with various sands were described, which showed that sands considered subgrade in normal concrete gave good performance with air-entrainment.

Air entrainment affects the water requirements, and reduces the compressive strength of concrete at the rate of three or four per cent loss per per cent of air-entrained for typical 5½, 6 and 6½-sack concrete according to Mr. Walker. A minimum of three per cent air must be entrained, however in order to secure the improvements inherent to air-entrained concrete. The compromise desired is not to exceed five or six per cent of air, which introduces a control problem of importance.



C. "Dolly" Gray, Ready Mixed Concrete Corp., Indianapolis, Ind.

Several variables in their effects on the degree of air-entrainment are complicating, said Mr. Walker. For example, the grading of the fine aggregate has a bearing on the amount of air-entrained; in general the finer aggregate entrains more air than coarser grades do. Lean mixes entrain more air than richer ones do and even temperature is an influencing factor. Slides were used to show strength variations in relation to air content. Calcium chloride, according to Mr. Walker, may be used in air-entrained concrete to overcome early loss in strength.

In commenting on the controversial subject of mill-ground air-entraining cement versus the addition of the air-entraining agent at the mixer, Mr. Walker said that the use of mill-ground air-entraining cements would be preferred but for the fact that many kinds of concrete often are specified from a given plant, introducing variables. Addition of the agent at the concrete plant has the advantage that the amount may be adjusted for different mixes but a difficulty is that cements vary in the amount of air that will be entrained using the same amount of agent.

In approaching the subject of control of quantity of air, Mr. Walker mentioned that, without control, it would be very simple to incur a loss of strength as much as 50 per cent without knowing it. He described the gravimetric, volumetric and the recently-developed pressure methods for measuring the quantity of air entrained in concrete. The gravimetric method consists essentially of weighing a unit volume of concrete on scales and computing the volume of air. The volumetric method involves removal of the air and measurement of the volume left, by placing a sample in water, stirring the air out and measuring the reduction in volume.

The pressure method, which Mr. Walker considers most dependable, is a product of the portland cement industry and the National Ready Mixed Concrete Association and is based in principle on Boyle's law that the volume of a gas varies inversely as the pressure applied to it. Since the concrete has only one ingredient, the air, that is compressible, the apparatus developed for the purpose is simple of operation. It consists of a container for the concrete sample and a pump to apply pressure, knowledge of the pressure (by gauge) making it simple to determine the volume of air in the mass.

Pressure apparatus for this purpose is manufactured by George Heck, St. Paul, Minn., and will soon be placed on the market by Central Scientific Co., Chicago, Ill. Practical application of the apparatus, which will be in the price range of $125 to $160, was demonstrated by Mr. Walker after the meeting, on one of the field trips to the laboratory of Consolidated Rock Products Co.

Louis C. Schilling, I. E. Schilling Co., Miami, Fla.

Considerable interest was demonstrated in the apparatus, on exhibit at the speakers' table, and a number of questions were asked of Mr. Walker. In reply to a question as to the practicality of the pressure method when lightweight aggregates are used, Mr. Walker said that there are complications since the aggregate itself contains air. The apparatus would be helpful if the aggregate has uniform porosity.

Further discussion developed that the determination of air entrained should be made at destination, and that the proper amount of vibration

Malcolm McIntyre, Basalt Rock Co., Inc., Napa, Calif.

in placing concrete would probably be of no significance in its effect on air removal. There is no objection to using high early strength cement in connection with air entrainment. In central mix operations the opinion was expressed by Mr. Walker that a correlation at the job could be made with measurement at the plant. As to frequency of determination, Mr. Walker said that it may develop that only one test a day might be necessary.

Merchandising Ready Mixed Concrete

AN OPEN FORUM on the merchandising of ready-mixed concrete was conducted, according to annual custom, with ROBERT C. COLLINS, Warner Co., Philadelphia, Penn., chairman of the committee on merchandising, leading the discussion.

Mr. Collins started the floor discussion by reviewing topics considered at past meetings and, particularly, benefits that have resulted from the interchange of sales contracts, with protective clauses covering penalties for excessive unloading time, roadway conditions, etc. He reported that there was a great deal of interest in sales contracts and, in stressing the need for keeping contract provisions modern and up-to-date, cited cases where loopholes have been found in contracts whereby purchasers have disclaimed liability for damage to truck equipment, when the producer believed he was fully covered. Sales contracts must be under constant study, he urged.

The problem of delays of truck mixer equipment on the job continues to be an "unsolved problem" according to H. F. THOMSON, General Material Co., St. Louis, Mo., who led off the discussion of this perennial subject.

E. M. HAMMOND, Gravel Products Corp., Buffalo, N. Y., said that his company allows 15 minutes free waiting time with a penalty of $5 per hour after that. The time is marked on all delivery tickets, which are signed by the superintendent on the job.

LOUIS C. SCHILLING, I. E. Schilling Co., Miami, Fla., allows 15 minutes free time per cu. yd. of concrete with a penalty of $4 for overtime. The charge is collectible, but excess unloading time has been found to upset seriously the scheduling of deliveries. As Mr. Collins expressed it, the industry does not want penalty payments but prefers to get the trucks released on time.

FRANK L. KELLY, Colonial Sand and STONE CO., INC., New York, N. Y., said that his concern permits 20 minutes free time with a $6 charge hourly for excess unloading time. The company operates a fleet of 5½- to 8-cu. yd. truck mixers with some of 9-cu. yd. capacity recently added. Excess abuse of unloading time restrictions has resulted in refusal to deliver concrete to the defaulting customer and furnishing him loose materials instead. CHARLES W. SHIREY, Waterloo, Iowa, and Mr. Collins said that servicemen were of great help in securing early release of moving equipment.

EUGENE SUNDT, Albuquerque Gravel Products Co., Albuquerque, N. Mexico, was asked to relate some of the problems he encountered, and methods employed, in entering the ready-mixed concrete business a little over a year ago. Mr. Sundt's established policy was to improve the quality of concrete and his business is being built on that basis.

One of the difficulties was that contractors were prone to add extra mixing at the jobsite so a policy was established that water could only be added at the plant. If the contractor insists on the addition of excess water, it is recorded on the delivery ticket.

The plant was set up for quality control. The company produces its own sand and gravel in order to have close control over gradation. Coarse aggregate is sized from No. 4 to ⅜, ⅜-¾ and ¾-1½ in. in order to obtain a maximum density gradation. Sand is produced to 4 per cent minus 100-mesh, and moisture corrections are made daily.

An intensive advertising and promotional program has been started since cement has again appeared in the material yards and competition with job-mixed concrete has begun. Booklets are used outlining the company's aims to architects and engineers. Concrete is sold on a guaranteed strength basis. The company has engaged an advertising agency as an aid to promotion of sales for home construction and has started radio advertising.

George Thwing, Jr., Triangle Certified Concrete, Inc., San Bernardino, Calif.

Jos. M. Scheinin, James A. Norton, Inc., New York, N. Y.

Advertising and Sales Promotion

Ready-Mixed concrete producers were shown some of the ways in which they can develop and build markets for their product by W. D. M. Allan, director of promotion, Portland Cement Association, Chicago, Ill., who stressed the value of advertising and promotional campaigns before the National Ready Mixed Concrete Association convention.

Mr. Allan reminded that today's markets were built in the past and that markets of the future depend upon market-building practices of today, in urging that the industry recognize the necessity for sales promotion activity carried over the years. It must be remembered, he said, that most concrete jobs are won by a nose.

Mr. Allan expressed the belief that housing will be the biggest single item of new construction in 1947; with highways and streets next; structures such as hospitals, schools and other public buildings, third; farm improvements fourth, and conservation next in volume.

It was pointed out that the highway improvement program may present a large volume market for ready-mixed concrete since much of the needed construction will be overpasses and underpasses for express highways, which will be within easy reach of urban ready-mixed concrete plants. Mr. Allan further pointed out that the largest secondary federal-aid road program in history will make thou-

(Continued on page 181)

"Jam Session" Proves Popular

American Concrete Pipe Association convention in St. Louis discusses research program, wire reinforcement standardization, new markets, and methods of installing pipe

H. P. Ford with Mrs. Ford and his daughter

F. B. Grey, Thomasville, N. C., and Mrs. H. X. Eschenbrenner, Columbus, Ohio

Mrs. G. H. Redding, Chicago, and J. E. Miller,

PRESIDENT ELMER L. JOHNSON, Concrete Conduit Co., Colton, Calif., in his opening remarks at the American Concrete Pipe Association convention in St. Louis, February 24 to 26, discussed activities during the past year and prospects for 1947, which indicate an increasing volume of business this year.

MANAGING DIRECTOR HOWARD F. PECKWORTH, in his report, pointed out that while 1946 could not be considered a normal year, 2,287,807 tons of concrete pipe were produced as compared with 1,510,000 tons in 1945. The peak production year, however, was 1942 with 4,000,000 tons. Seven regional meetings were held, and nearly all of the 142 members attended at least one of them. Plans call for regional meetings in all ten districts during 1947.

E. F. BESPALOW, chairman of the Technical Problems Committee, reported the progress of three major research projects now being conducted by the association. These concern the sulfied problem, the solution of bedding and backfill problems, and the hydraulic tests now being carried on at the St. Anthony Falls Hydraulic Laboratory under the direction of Dr. Lorenz G. Straub, University of Minnesota. Mr. Bespalow reported that tests are now being run on 24-in. concrete pipe and that soon comparative tests will be made with metal pipe.

Standardization of reinforcing wire mesh was a particularly live subject up for discussion. As a result of meetings held with representatives of the Wire Reinforcement Institute and research work, plans have now been drawn up for the adoption of 28 standard sizes as compared with some 320 used in the past. The convention approved the standards submitted by the committee which now will be presented to the National Bureau of Standards, Department of Simplified Practices, for final research, an analysis and decision.

E. H. FOX, Cincinnati Concrete Pipe Co., presided at the Jam Session in his usual amiable manner. Problems of a technical nature were submitted by members from the floor and were answered by a panel of experts or other members. One of the questions which received much discussion concerned the substitution of concrete pipe for metal pipe for drainage purposed in industrial buildings. The consensus was that this is good practice as long as high pressures were avoided. It was also pointed out that concrete pipe had been used for air ducts to remove dangerous fumes in garages, etc. Another question brought up was whether an unreinforced irrigation pipe will stand up or crush in a 2-ft. trench in freezing and thawing weather. The discussion developed that generally there would be no trouble if C-14 pipe is used with a 2-ft. cover. Heaving, however, is apt to have a poor effect on the bells if the bell-and-spigot joint is used. Discussion on the use of fly ash in the concrete mix used in the manufacture of concrete pipe indicated that its use gives plasticity, elasticity and strength in machine-made pipe. Such use does not slow setting time provided the pipe is steam cured.

Election of Officers

Elmer L. Johnson, Concrete Conduit Co., Colton, Calif., was re-elected president; H. X. Eschenbrenner, Universal Concrete Pipe Co., Columbus, Ohio, was re-elected vice-president; and

Mr. and Mrs. Briggs, Lake Charles, La.

T. J. Walsh, East St. Louis, Ill., and Mrs. C. H. Bullen, Chicago, Ill.

Mrs. Johnson and E. L. Johnson, Colton, Calif.

New board of directors of the American Concrete Pipe Association in session

Henry C. Eames, New England Concrete Pipe Corporation, Newton Upper Falls, Mass., and F. B. Gray, Gray Concrete Pipe Co., Thomasville, N. C., were elected second and third vice-presidents, respectively. G. B. Denham, Faulkner Concrete Pipe Co., Hattiesburg, Miss., was elected secretary, and C. H. Bullen, Mid-West Concrete Pipe Co., Chicago, Ill., was re-elected treasurer. New members of the board of directors chosen for three-year terms are: E. H. Fox, Cincinnati Concrete Pipe Co., Cincinnati, Ohio; T. J. Walsh, Nelson Concrete Culvert Co., Champaign, Ill.; and Hugh P. Ford, Eugene Concrete Pipe and Products Co., Eugene, Ore.

Highway Program

HAL H. HALE, executive secretary, American Association of State Highway Officials, discussed "Highways in the Economic Structure of the United States" at the Tuesday morning session.

Mr. Hale pointed out that the highways of the nation are one of the few public works which are self-sustaining, for they are financed by funds secured in the sale of gasoline. He reported on funds presently available for the development and maintenance of roadways, and warned against the philosophy that highway construction can be deferred along with other public works to serve as an economic stabilizer during depression cycles. He stated that it took a war to teach us that we move on wheels, and that in view of recent experiences maintenance of good highways is essential to the economic and social progress of the nation.

Further discussion of the highway picture followed, when D. C. GREER, state highway engineer, Texas Highway Department, talked on "The Federal-State Farm-to-Market Road Program."

Suggests Lightweight Aggregates

R. ROBINSON ROWE, senior bridge engineer, State of California Department of Public Works, Division of Highways, spoke on "Concrete Pipe Culvert Practice in California." Rowe stated that three problems have received particular attention in California: 1. high overfills; 2. pipe weight; and 3. installation under traffic.

Under the subject of overfills, the speaker pointed out the two methods now specified in California. First, Method A or first-class bedding; and second, the imperfect trench method,

E. H. Fox, Cincinnati, Ohio, and H. F. Peckworth, Chicago

H. M. Shaw, Raleigh, N. C., and H. W. Chutter, Fresno, Calif., in some close harmony

Mr. and Mrs. Colegrove, Royal Oak, Mich.

Henry O. Strohecker, Jr., Charlotte, N. C., and J. B. Hunt, Raleigh, N. C.

Mrs. Parker and L. M. Parker, Memphis, Tenn.

Mrs. Denham and G. B. Denham, Hattiesburg, Miss.

H. H. Dickehut, Austin, Texas, Mrs. Dolch and L. F. Dolch, Dallas, Texas

Mrs. Lander and R. S. Lander, Little Rock, Ark.

Howard Schurmann, Indianapolis, Ind., with his daughter

known as Method B. In California, they extended the Marston and Spangler computations in the orthodox fashion except for the unlimited overfills permitted on small standard pipes and nearly all sizes of extra-strength pipe.

Discussing the weight of concrete culvert pipe used in California, Mr. Rowe said, "Once installed the weight of concrete pipe is an advantage, being a measure of its rigidity and resistance to wear. But en route to the site and during placement this weight is a disadvantage that often causes the selection of some other type of culvert.

"We have reduced the weight requirement to that of standard pipe by specifying first-class bedding instead of ordinary bedding and extended the reduction into the range of high overfills by specifying Method B backfill." He further stated that it might be possible to eliminate about one-third of the present weight by the use of lightweight aggregates in pipe manufacture. A research problem along this line was suggested as a project for the Association.

Concluding his discussion of pipe weight, Mr. Rowe said, "We do not know that lightweight pipe would be satisfactory for pressure pipe because of the porosity of the aggregates. For culverts, this would not be important. We have never called for pressure tests."

"Prestressed pipe is another solution to which considerable attention is being given by the industry now. We are watching developments with great interest."

Large quantities of culvert pipe are being placed in existing highways, he pointed out, replacing small timber spans or enlarging waterways that have proved inadequate. Where possible they avoid traffic obstruction by installing half of the culvert at a time while rerouting traffic to the other half of the highway. For this task new techniques for rapidly laying and jointing concrete pipe are required. The speaker's statement on the problem follows:

"For pipes large enough for inside jointing, there is no need for outside joints. It should be possible in one day to trench one-half the highway, lay three or four 8-ft. sections of pipe, cover the joints with burlap or roofing paper and backfill to grade. The other half could be laid the second day in a similar manner. The third day the wearing surface could be restored one-half at a time while the joints were being sealed from the inside. The technique could be developed to complete the work in three days and have only normal hazard on the highway at night."

PAUL JONES, director of public information, National Safety Council, gave an informal "off-the-cuff" talk on Tuesday afternoon designed to interest members of the American Concrete Pipe Association in home, road, and plant safety. Mr. Jones urged that top management take steps to make safety campaigns pleasing and interesting to all workers.

Big Reclamation Program

H. G. CURTIS, U. S. Bureau of Reclamation, presented two papers, substituting for Kenneth Markwell, assistant commissioner of the Bureau, and H. R. McBirney, chief of the Bureau's Canal Engineering Division.

Reading first Mr. Markwell's paper on "Economic Aspects of the Reclamation Programs," Mr. Curtis reported that the current construction program of the Bureau of Reclamation calls for the use of hundreds of additional miles of concrete pipe.

Discussing the use of concrete pipe, the report said: "Forty-five years of experience in water-conservation in the West has proved that concrete pipe is often the answer to an economic, sanitary, safe method of transporting precious water supplies. The use of concrete piping for important waterways in competition with conduits of other materials should increase as methods are devised to manufacture stronger yet lighter-weight precast concrete pipe and as improved methods for joining the section to form integral water-tight conduits."

He closed with, "I believe you will agree with me that it is shortsighted economy to delay Reclamation construction work which not only develops the West largely on a reimbursable basis to the Federal Treasury, but produces national wealth and taxes on a scale that increases with the passage of the years."

Mr. Curtis immediately returned to the speaker's stand to deliver a paper for H. R. MCBIRNEY, chief, Canal Engineering Division, U. S. Bureau of Reclamation, who was forced to remain in Denver because of ill health. The topic was: "Concrete Pipe—Its Use on Irrigation Works of the Bureau of Reclamation Projects."

The paper opened with a short background on the use of concrete pipe. Following the historical discus-

(Continued on page 178)

Mrs. Sudreth and N. N. Sudreth, Oklahoma City, Okla.

American Concrete Institute Discusses New Practices

CALLED TO ORDER by President Gonnerman at 2:03 p.m., February 24, the last session was adjourned by Past President Withey at 12:05 p.m., February 26. The timing is stated with such precision because this is in conformity with a long-established policy of the Institute.

Of the 2882 minutes of the convention, more than a third were assigned to the five sessions of the convention, and another third should have been allotted to sleep. Something less than 960 minutes were therefore available for committee meetings and all other activities.

We have employed the adjective *rigid* because it does describe the schedule. Through the years, various timing devices have been tried out, such as the flashing of signal lights. It is not unusual for a chairman to compliment or chide a speaker solely on the basis of the duration of his presentation, and sometimes a chided speaker shortens the presentation of his next paper in an effort to regain his reputation for succinctness.

When we think of a sack of cement, a few bucketfuls of water, and a few hundred pounds of aggregates, it is amazing how many procedures have been developed for proportioning, mixing, placing, and curing. Of course, when we realize that during one year, in the United States alone, millions of tons each of cement, water, and aggregates go into the production of millions of cubic yards of concrete, the importance of the whole matter becomes at once apparent.

And here is where the American Concrete Institute comes in. The mass of data and general information given out at an annual convention is enormous. No one could absorb all of it, but no one of the 296 members and guests—whether this was his first or his forty-third convention—could have failed to learn enough of interest and value to more than repay him for his journey to Cincinnati, frequent trips to the hotel desk to obtain a room assignment, and standing in line for each meal.

Grouting Practice

During the first session there was a symposium on cement grouting practice. The session leader pointed out that grouting is to some extent a neglected subject. Papers were presented on: Contraction Joint Grouting of Large Dams (Simonds), Notes on the Theory and Practice of Foundation Grouting (Minear), Oil Well Grouting Practice (Moeller and Roberts), and The Maintenance and Reconstruction of Concrete Tunnel Linings with Treated Mortar and Special Concrete (Keatts).

Mix Design

In the second session there were six papers on miscellaneous subjects: Concrete Mix Design (Swayze and Gruenwald), Apparatus and Methods for the Determination of Air Content of Fresh Concrete (Menzel), Cracks in Concrete (Steele), Erosion of Concrete by Running Water (Price), Painting Exterior Concrete Surfaces with Special Reference to Pretreatment (Burnett and Fowler), and Painting Interior Concrete Surfaces (Chisholm).

Precast Concrete

The third session was given over to an interesting symposium on precast concrete—which anyone will admit is a most timely subject. There were four papers: Some Problems in Structural Framing of Precast Concrete Houses (Amirikian), Precast Concrete Houses (Billner and Thorud), Basic Features of Design — Precast Concrete Warehouses (Amirikian), and Construction Kinks and Costs, Actual and Comparative — Precast Concrete Warehouses (Corbetta).

The last paper of this session was followed by a motion picture in color showing the construction of a precast concrete warehouse (200- x 600-ft.) for the U. S. Navy. It was the best film on the subject we have seen. A surprising variety of technique has been developed, and there is no reason to believe that many additional procedures will be developed. The progress of precast concrete construction is very encouraging.

New President

The fourth session started with a report of tellers on the annual election of officers and other members of the Board of Direction. The new president is Stanton Walker, director of engineering, National Ready Mixed Concrete Association. The address of the Retiring President, Harrison F. Gonnerman, summarized the accomplishments and the goals of the Institute.

The papers of the fourth session—like those of the second—were on miscellaneous subjects: Comparative Bond Efficiency of Deformed Concrete Reinforcing Bars (Clark), Bond Characteristics of Commercial and Prepared Reinforcing Bars (Collier), Some Observations on Using Theoretical Research (Powers), and Proposed Revision of Building Regulations for Reinforced Concrete (Report of Committee 318).

The last event of the convention was an open session of Committee 115, on research. A short progress report was presented on each of eleven projects.

A noteworthy custom of the institute is the award of medals. These provide both inspiration and recognition. At this convention five names were added to the list of medalists: Leonard C. Wason Medal for the "Most Meritorious Paper" of ACI Proceedings Volume 42, to Gerald Pickett, for his paper, "Shrinkage Stresses in Concrete"; Leonard C. Wason Medal for "Noteworthy Research" to Charles E. Wuerpel, for the work reported in his 1945 paper, "Laboratory Studies of Concrete Containing Air-Entraining Admixtures"; American Concrete Institute Construction Practice Award for a "paper of outstanding merit" on concrete construction practice to J. W. Kelly and B. D. Keatts, for their paper entitled, "Two Special Methods of Restoring and Strengthening Masonry Structures"; the Henry C. Turner Medal for "notable achievement or service" to Morton O. Withey "in recognition of forty years of outstanding contributions to our knowledge and understanding of concrete and reinforced concrete."

Test Waylite Concrete

PUBLIC ROADS ADMINISTRATION, Washington, D. C., recently announced the results of concrete made with Waylite aggregate and with Waylite dust replacing a portion of the portland cement in the mix. Comparisons also were made of the properties of concrete made with fine and coarse Waylite aggregate and with those of comparable concrete made with natural materials. Natural river sand and crushed limestone were used as aggregates for comparison.

In one series of tests, concrete with the base water-cement ratio of 0.70, the flexural strength increased as the percentage of Waylite dust increased, the maximum increase being 23 per cent with 40 per cent replacement. In the last group with a water-cement ratio of 1.00, the 25 per cent replacement gave the highest strength. The lower the water-cement ratio (richer the mix), the greater the percentage of Waylite dust is permissible. The use of Waylite dust as a replacement did not have the same beneficial effect upon the crushing strength of the concrete as for flexural strength. For example, for the mixes in which the base water-cement ratio was 0.8 or higher, the strength of the concrete containing Waylite dust was in most cases slightly lower than the corresponding straight portland cement concrete, the percentage of reduction increasing as the amount of Waylite dust used as a replacement was increased.

In comparing the concrete containing natural sand and limestone aggregates with the concrete made of Waylite aggregates, the Waylite concrete developed about 60 per cent of the flexural strength of the limestone concrete. Crushing strength results with moist-cured specimens agree very closely with the flexure results, the Waylite concrete giving about half the strength of the limestone concrete.

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Here's What "Western" Owners Have to Say!

J. A. B.: "after using your machine only 5 mos. the only repair I find necessary is the replacement of a V-Belt."

K. C. Block Company, "one of our city's largest contractors told us that we were making the truest block he was able to obtain."

R. L. Block Company: "The other day one of our operators made 365 blocks in ONE HOUR on your single machine. He has made consistently 320 *per hour*.

AUTOMATICALLY CONTROLLED
NO LEVERS

Proven Capacity: 1500 to 4000 Blocks Per Day

Complete Plant equipment for the Block manufacturer (mixers, conveyors, hoppers, sturdy steel drying racks with 56 block capacity, lift trucks and drying room heating equipment). Dept. P.

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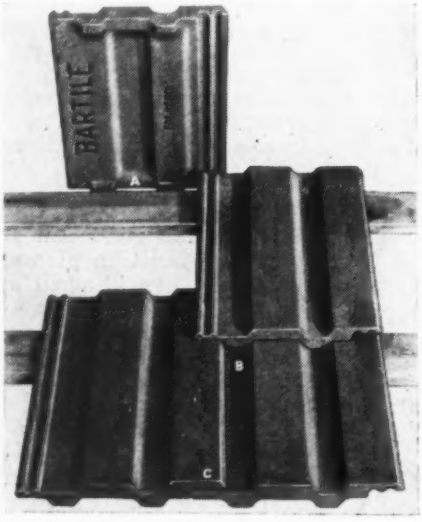
Roofing Tile Machine

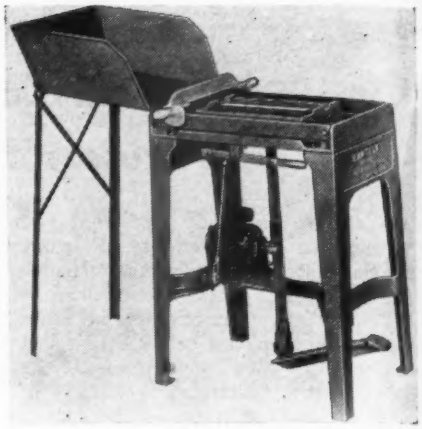
E. P. BARBER CO., Los Angeles, Calif., has developed the Bartile roofing tile machine for the manufacture of a colorful, lightweight concrete tile. As shown in one of the illustrations, this machine makes a distinctive, interlocking shape designed for easy installation, and in a wide range of colors. The machine produces from 120 to 150 tile per hour.

Consisting basically of a specially designed metal stand on which is mounted a mold, and a hand-operated



Showing how tiles interlock

tile-shaper or trowel, the machine is arranged so that the mold fits a thin metal pallet which shapes one side of the tile and supports the tile until it is sufficiently cured to retain its shape during the curing period. Mounted on the stand is a ¼-hp. electric motor with an eccentric device



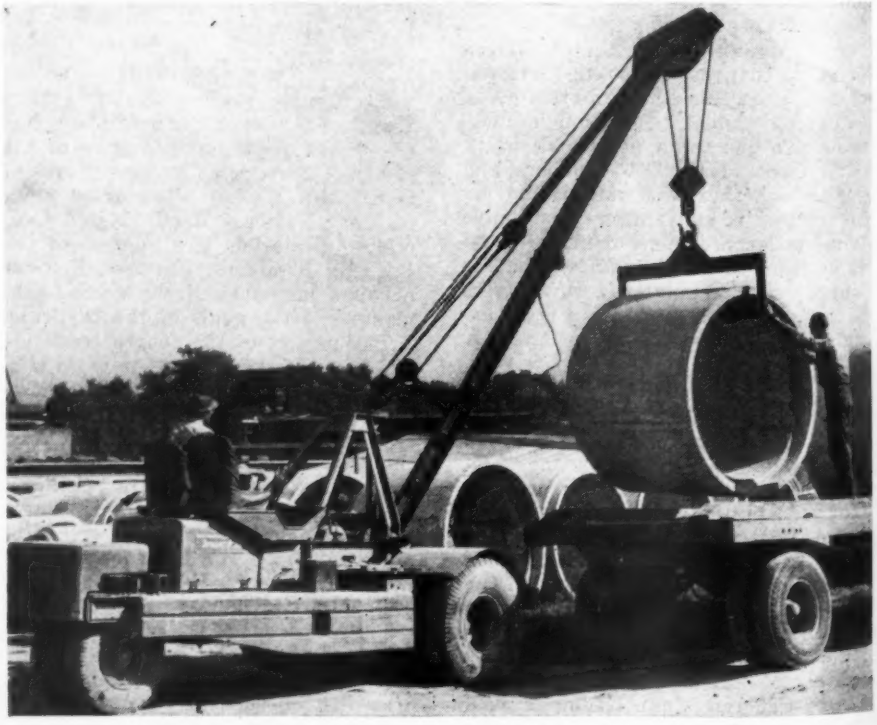
Roofing tile machine manufactures an interlocking product in many colors

that vibrates the pallet so that the plastic cement mix is settled solidly in the mold. Attached to the stand is a foot-operated device that ejects the finished tile supported by the pallet. The trowel is so designed that it moves easily across the top of the mold, shaping and glazing the face or upper side of the tile. The finished tile sets sufficiently in 12 hours to be removed in a sheltered place out of the sun from the pallet. Tiles are then stacked in a sheltered place out of the sun and sprinkled with water several times daily for 10 days. Trim (rakes, ridges and hips) is made in a similar manner, but no ejector or vibrator devices are necessary.

Mobile Crane

SILENT HOIST & CRANE CO., INC., Brooklyn, N. Y., has developed what has been called, the Krane Kar Mobile Swing Boom Crane. It is very easily maneuverable, and has been used to handle large concrete pipe and other

(Continued on page 179)



Handling large concrete pipe in the yard of Concrete Pipe & Products Co., Richmond, Va.

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Meet the Blue Brute Portable Self-Priming Centrifugal Pump, newest development of Worthington's 100-years-plus of experience in the design and manufacture of pumps. Fabricated of rust and abrasion-resisting alloy steel, it is ruggedly built to take the hardest knocks, yet light in weight for easy portability.

Fast, unfailing self-priming is a built-in feature of its advanced hydraulic design — not a troublesome auxiliary device. There is no priming valve to get out of order, none of the usual "recirculation" that reduces capacity or efficiency. The result is quick, dependable pick-up of water at all times.

Thoroughly tested in the modern research laboratories of the world's largest builder of pumps, this latest addition to the famous Blue Brute Construction Equipment line is a compact, streamlined portable pumping unit — in which simplicity of design and sturdiness of construction provide top performance under severest operating conditions . . . further proof that *there's more worth in Worthington-Ransome.*

For additional information on Blue Brute Portable Self-Priming Centrifugal Pumps, see your nearby Worthington Distributor. Or, write for Bulletin W-2010-B2.

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Blue Brute Pumps are built to the standards of the Associated General Contractors of America, Inc., and carry the A.G.C. rating plates.

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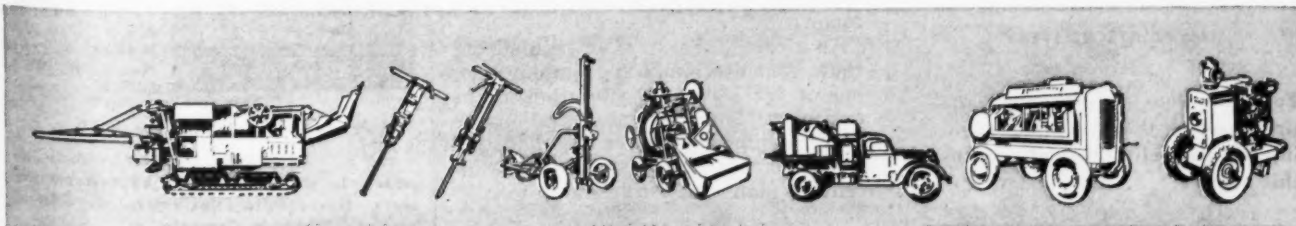

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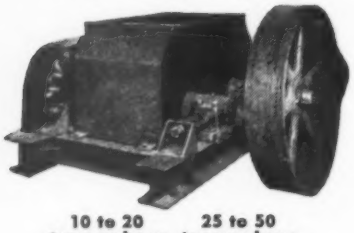
FOR BLOCK MAKERS



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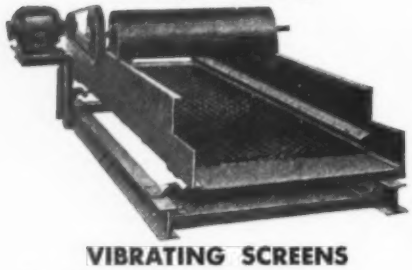

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Pipe Convention

(Continued from page 174)

sion, Mr. McBirney's paper went into an examination of concrete pipe work now under way. A project designed to prevent a serious water shortage in the Salt Lake Valley area has been under way for the past four years. A 42-mile aqueduct is being constructed with pipe of 69 in. internal diameter and with a wall-thickness of 7½ in. The pipe manufactured in 20-ft. lengths has a bell and spigot joint with a 1⅛ in. diameter rubber gasket as the sealing medium. The pipe is designed for operation under a maximum internal head of slightly over 150 ft.

It is expected that work on a similar project, known as the San Jacinto-San Vicente Aqueduct, will be completed sometime this year.

In conclusion, this paper recommended the following to the members of the American Concrete Pipe Association:

"1. That you strive further to develop or improve an adequate joint for use under moderate pressure heads that can be utilized without restriction on all of our projects.

2. That you work out some plan, possibly educational or by agreement with general contractors or by utilization of your own trained personnel, by which the Bureau can accomplish field installation of pipe supplied by your plants economically under contract, where the quantity of pipe and accessibility to the plants are not such as to justify advertisement requiring supply and installation under guaranteed tests.

3. That you provide as individual members, or through some cooperative agreement sponsored by your Association, transferrable smaller plants that can be used in the manufacture of pipe, both irrigation and pressure, on relatively small contracts not accessible to operating plants.

4. That you make competitive bidding possible to all Bureau projects on those types of pipe manufactured by your membership, which have the unqualified approval of this Bureau and which if not restricted by patent agreements limiting competition, we would particularly desire to purchase and install. This will apply primarily to concrete pressure pipe. Many types of pipe are not purchasable in certain project areas.

5. That to the extent consistent, and subject to certain protection of investments for developmental expenditures, you make available to other reputable member manufacturers, by licensing agreements, patented features, as, for example, joint assemblies and expansion and contraction joint units, on such basis as to make it possible for this Bureau to specify the use of these features with some assurance that the fee charged will not be such as to preclude bidding by those not owning rights to the patented product."

On Wednesday morning, after a banquet attended by nearly 200 persons, the members of the Association gathered to hear John A. Patton, management engineer, discuss some of the working principles of the wage incentive plan. He answered the hypothetical question of "Why incentive plans for the concrete pipe industry?" by saying, "We must set up incentives so that we can pay for output today so that we can be successful tomorrow."

In closing, the speaker pointed out that consultation with employes is one of the keys to the solution of the entire problem. He stated that in one concrete pipe plant overall production is up 125 per cent since the wage incentive plan was established.

Affairs in Washington

E. LAWRENCE CHANDLER, eastern representative of the American Society of Civil Engineers, in his talk, "Affairs in Washington Affecting the Construction Industry," derided efforts to control the construction industry. Speaking of recent wartime efforts to control industry, Mr. Chandler said, "If any one thing has been demonstrated more than another it is that the philosophy of centralized government control of the business of the country is not sound."

Looking toward the future, Mr. Chandler reported that with the exception of three or four items, shortages have been relieved and there is reason to believe that supplies of materials will be ample to meet the demands of a large program of construction during this year. He said that estimates indicated $6,000,000,000 will be spent for housing construction in 1947, plus $8,000,000,000 for non-residential construction. There is every reason, he said, to look forward to an even larger volume for some years to come.

Next Meeting in New Orleans

The convention closed with an address by H. Roe Bartle, Chief Scout Executive, Kansas City Area, Boy Scouts of America. There followed a formal meeting of the new board of directors and officers at which it was decided to hold the 1948 convention in New Orleans, La., sometime next February, and to hold the executive committee meeting in the summer at

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Uniform, Controlled Concrete

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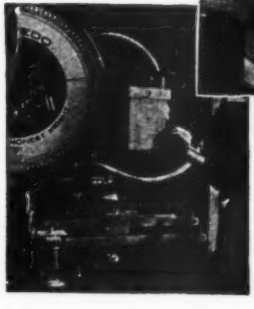
Moisture Meter

Makes a test for moisture content of fine or coarse aggregates in ONE minute. Accurate to ¼%.



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Delivers correct DRY weight of wet aggregates and ADDED water. Makes a graph record of EVERY BATCH.

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Yellowstone National Park, in connection with the regional meeting. The following committees were appointed: Executive, Elmer L. Johnson, president; H. X. Eschenbrenner, first vice-president; Geo. B. Denham, secretary; and E. H. Fox and Hugh P. Ford, directors; Nominating, J. D. Molldendorf, chairman, E. A. Neuman, D. D. Dunkle, Carl Bluedorn, and Henry M. Shaw.

Mobile Crane

(Continued from page 176)

materials. The illustration shows its operation in a large southeastern concrete pipe yard. It may also be equipped with a clamshell bucket. One engine provides power for the crane mechanism and for traveling. The chassis is fitted with either a gasoline engine or a Diesel engine, and it has electric lighting and starting equipment. It is claimed that it can easily negotiate grades up to 15 per cent under load. The Krane Kar is available in three standard sizes: Model A 5000 lb.; AX 10,000 lb.; and AY 20,000 lbs. capacity.

Faster Handling of Materials

MIXERMOBILE MANUFACTURERS, Portland, Ore., has announced the addition of power steering and an enclosed cab as optional equipment on

Material handling unit with power steering and enclosed cab

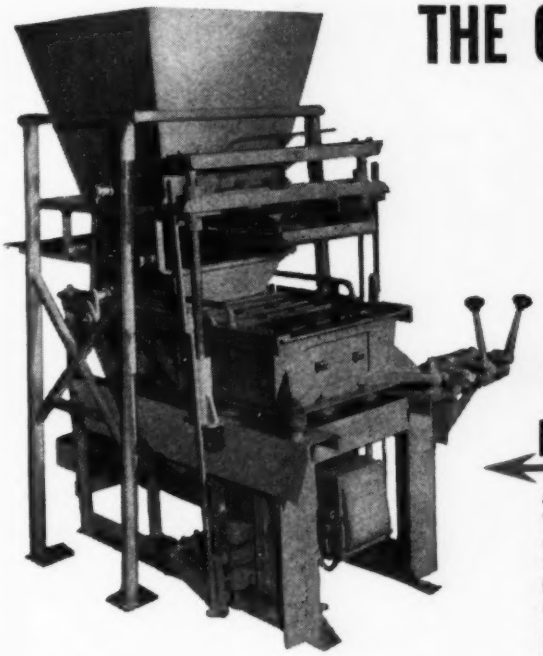
the standard Scoopmobile, a tricycle type materials handling machine. The Vickers hydraulic system actuates the power steering mechanism. Another improvement is the enclosed cab, featuring a full-size upholstered seat, windshield wiper, and a large safety plate windshield. Doors are arranged to be latched open in warm weather.

Making Burial Vaults

WALLA WALLA CONCRETE PIPE CO., Walla Walla, Wash., a large manufacturer of concrete pipe, has entered into the production of concrete burial vaults. It is also a manufacturer of concrete block and a complete line of precast products. Pumice is used as an aggregate.

Introducing A New High Production

GRAVELEY VIBRATOR



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IMPERIAL BLOCK MACHINE

800 Block Per Hour With a Single Operator . . .
Semi-Automatic . . .
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Five Models of Complete Plants (125 to 800 Block Per Hour Capacities)

Concrete Mixers (6 to 28 cu. ft. Capacity—Or Larger to your specifications)

Hoppers — Conveyors — Pallets — Racks — Lift Trucks — Overhead Racking Hoists

This newest Graveley "Better Built" vibrator combines the tested basic principles of earlier models with a completely new system of hydraulic power operation . . . Result, a vibrator which produces 400 dense, nonporous, beautifully finished, 8x8x16 inch building block per hour, or 800 block per hour with two machines operated by one man at a single set of hydraulic controls. Two machines can be fed by twin hoppers supplied by one mixer and one conveyor.

Precision-built of highest quality materials for long, high production life . . . Operates efficiently with all types of aggregates . . .

All moving parts quickly, easily, and economically replaceable . . .

Attachments for all popular block sizes . . . Field proven by exhaustive tests . . . Free engineering service in setting up your high-production plant.

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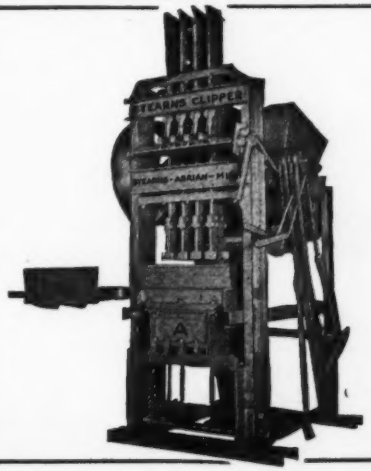

"ANCHOR"

Complete equipment for making concrete, cinder and other light weight aggregate units, including engineering service for plants and revamping of old ones for more economical service. Stearns Clipper Stripper Machines, Stearns Joltcrete Machines; Stearns Mixers; cast Iron and Press Steel Pallets. Straublox Oscillating Attachments, etc.

Repair parts for: Anchor, Stearns, Blystone Mixers and many others.

ANCHOR CONCRETE MCHY. CO.
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300 HIGH QUALITY CONCRETE BLOCKS PER HOUR WITH THE—

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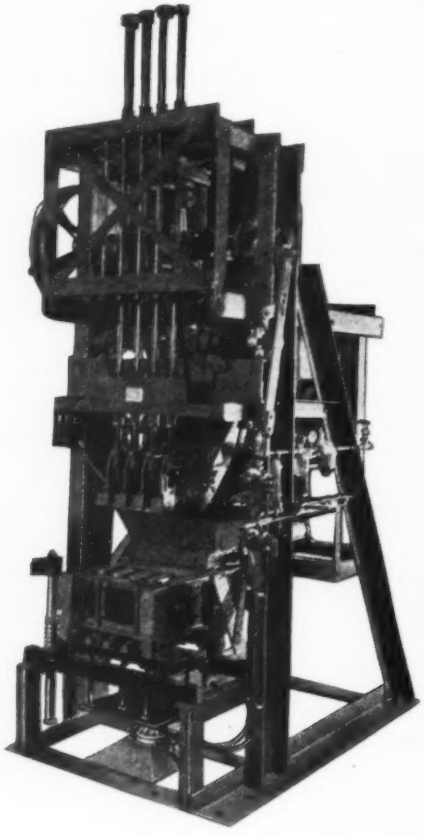
AIR OPERATED POWER STRIPPER



You can make 300 perfectly formed 8x8x16 in. cored block per hour with the Kelley Air Operated Power Stripper.

Machine is strongly built and simply designed to insure minimum initial and operation cost. All ordinary wearing parts available from stock and easily installed.

Attachments for making 3, 4, 6, 8, 10 and 12 in. widths and fractional lengths, sash, corner, etc.

KELLEY will assist in designing your new plant for maximum efficiency.

Other KELLEY Equipment

Paddle Blade type mixers of the most simple and efficient design with clutch pulley or direct motor drive.

Skip Hoists, Conveyors, Hoppers, Bucket Elevators, Screens, Crushers, Lift Trucks, Racks and Pallets.

30 Years of Service to Industry

Everything for the Concrete Products Plant

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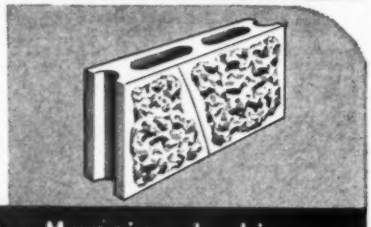
STONE FACED BUILDING BLOCK!

Protect Your Future!

A new development that brings the heretofore expensive stone house within the reach of thousands. Stone is embedded in the block. Beautiful construction. Low cost molds and simple manufacturing process. Territorial agreements now being made. Write, phone or wire for descriptive literature.



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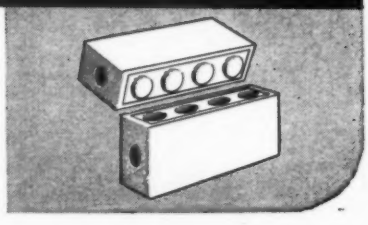
INTERLOCKING BUILDING BLOCK

Add these profit makers!

LAY-MORE BLOCK MACHINES use compressed air process to manufacture a four inch concrete building unit. Cavity wall construction. Knobs and cups are firmly interlocked with pure cement bond. Low cost Machines. Write for descriptive literature.



New Block Plants

DELLS CONCRETE BLOCK CO., Dells, Wis., is producing 2000 block per day. Kyran Cassidy and William Doyle are the owners.

GLENWOOD BLOCK CO., Glenwood, Minn., organized recently by Arthur Johnson and Arthur Hitman, has a production capacity of 1800 concrete block per 10-hour day.

C. E. PATTON, Indianapolis, Ind., has been named northwestern distributor for the F. C. George Concrete Block Machine Co., Orlando, Fla.

RILEY BANTA has started manufacturing concrete block in Sidney, Mont. His two sons are associated with him in the business.

PETERSON BROS., Waseca, Minn., have purchased the R. & B. concrete block plant from Harley Rohlf and Sy Bruchs.

ESCAMBIA CONCRETE CO., INC., Brewton, Ala., has started the production of concrete brick and ready mixed concrete. E. B. Kirkland is general manager of the plant which has a capacity of 10,000 brick per day with a future increased capacity of 12,000 to 14,000 brick per day. Both natural colored gray and colored brick are produced.

CHARLES PETROZAK AND PAUL BRONESKY, Middletown, N. Y., have started the manufacture of concrete block.

J. E. THOMPSON AND G. FORBES, Oswego, Ore., have started erection of a plant to manufacture pumice building block for industrial and home uses.

JEFFERIES AND SONS, Calgary, Alberta, Canada, recently purchased a Besser Super-Vibrapac while en route home from the National Concrete Masonry Association convention in Chicago, Ill., and will soon begin the manufacture of concrete block. They have been engaged in the sand and gravel and excavating business in Calgary.

HUBBARD BLOCK & SUPPLY CO., Piqua, Ohio, is erecting a plant to produce from 1500 to 2000 concrete block per day. Travis S. Hubbard, veteran of the Navy, is president and general manager of the company.

TORRINGTON CEMENT PRODUCTS, Torrington, Wyo., is the name of a new concrete block plant operated by Darrel Brown and Dominic Feely, returned veterans. Other concrete products will be manufactured in the near future.

AMERICAN CONCRETE BLOCK CO., Shreveport, La., has started the production of cinder concrete block. Owners and operators of the plant are E. A. Hamner, E. A. Hamner, Jr., and R. E. Hamner. Plant superintendent is W. T. Rippy. Capacity of the plant is 4000 partition block and 4800 standard 8-in. block per day.

VASHON CONCRETE PRODUCTS CO., Seattle, Wash., has been incorporated with a capital of $10,000 by Howard Friar of Seattle.

Ready Mix Convention

(Continued from page 171)

sands of now isolated farms accessible for the delivery of ready-mixed concrete for farm improvements over paved roads.

Analyzing the home market, he said that 27.3 bbl. of cement will go into the construction of an average unit in 1947 (21.6 bbl. in 1946) or the equivalent of 3.8 cu. yd. of concrete. The potential market would be 3,800,000 cu. yd., on the assumption that the goal in new house construction will be attained.

The degree of increase in the use of ready-mixed concrete to result from the approaching vast building program will depend upon factors within the control of the producers themselves, said Mr. Allan, in suggesting consideration of a long-range market-building program including the use of newspaper, magazine, radio and even television advertising.

He stressed the importance of continued promotion effort, stating that money spent on advertising and similar promotion activities is wasted if the program be stopped short of the goal.Continuous promotion is, on the other hand, the way to build markets.

Lightweight Aggregates for Concrete

CHARACTERISTICS of the various lightweight aggregates for concrete and recent developments and trends in their production and improvement were discussed before a joint meeting of the National Sand and Gravel Association and the National Ready Mixed Concrete Association by Raymond E. Davis, professor of civil engineering, University of California.

He discussed Haydite and other manufactured aggregates including the expanded slags; also pumice, scoria and volcanic ashes which comprise the natural lightweight aggregates group. Of the natural aggregates, he said that pumice is the only one to date that has had real potentialities, although all aggregates of igneous origin had high absorption characteristics and were limited in their strength potentialities.

The ideal lightweight aggregate for structural concrete as well as precast concrete should, he said, have surfaces reasonably sealed to hold absorption down, and should be light and have smooth texture.

Some of the more recent developments to attain "ideal" lightweight aggregates were briefly mentioned. One was the process developed in Florida whereby pulverized Fullers earth was nodulized with water and processed in rotary kilns. One of the objectives was to produce an aggregate that would require no crushing after manufacture.

Also described was the California development, also based upon presizing, whereby an oil-impregnated di-

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atomacious shale was nodulized. In this process, a powder of higher fusion material was added in the kilns to coat the particles to prevent sticking.

Rocklite, a product manufactured at Ventura, Calif., from shale was mentioned as one of the outstanding aggregates, having low absorption, smooth surface texture and being capable of developing concrete in excess of 6000 p.s.i. compressive strength, yet weighing only 110 lb. per cu. ft.

The foregoing examples were mentioned to indicate trends in attempts to fulfill heavy demands for lightweight aggregates. In Prof. Davis' opinion, the pumices may be improved a great deal by heat treatment, to reduce absorption in pumice concrete and to increase strength.

Another very recent development mentioned was obsidian aggregate, a volcanic glass with contained water and essentially of the same composition as perlite. When heated, a product weighing 20 lb. per cu. ft. after fusing is produced at relatively low expense but Prof. Davis did not know its commercial possibilities.

In commenting on the super lightweight aggregates, including the perlites and vermiculite in the less than 10 lb. per cu. ft. weight class (concrete of 30 lb. per cu. ft.) he said that some 30 different interests in California are active in developing perlite aggregate.

In reply to questions as to the direct value of lightweight aggregates to ready-mixed concrete producers, it was pointed out that such concrete has application in multi-story construction with definite savings.

Housing

FRITZ B. BURNS, president, Kaiser Community Homes, presented a very interesting, and we might add amusing, "Housing Report for 1947" before a joint session of the two Associations. Mr. Burns commented particularly on the red tape and false approach to the problem that really prevented more homes being built under the Wyatt program.

The trouble with the Wyatt program, he said, was that an attempt was made to build more houses than could be done, with the result that the number built actually was less than it would have been if fewer houses were started. The program concentrated on starts of new houses in the face of shortages of materials, when the emphasis should have been on the materials. In effect, an attempt was made to start a million homes with materials available for only half that many, so it took twice as long as it should have to finish those that were completed. The number finished in 1946 was the figure predicted by the builders. Mr. Burns said that it was surprising that any houses were finished, with some 800 items required and conditions existing where one builder had all the shingles, another all the small nails, etc.